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QSP

You had better believe that I was more than a little peeved when I took a close look at last month's edition. Your editor had lectured for a full page-and-a-half about using 'corner flashes' for Classifieds and competitions from now on — and there wasn't one to be found. *Any*where. Guess who got a flood of letters asking what the heck a corner flash is?

Uh-oh. Time to shoot the printer!

I was as happy as a mozzie in a nudist camp on a hot summer's night when I discovered that our very, very dear printer had very, very carefully cut all the corner flashes from last month's issue because he thought my computer had thrown a wobbly.

It wasn't the *computer* which threw the wobbly, I promise you. I'm surprised they didn't hear the shouting clear across in Perth. This month's issue had *better* have the flashes. In fact, you'll find *another* competition one at the bottom of this page (I hope).

The upshot of it all is that I've decided to extend last month's competition to win one of four **Mobile One** two metre base station antennas. After all, if you couldn't find the flash, how could you enter?

Once again, I've modified one of the photographs in this edition. All you have to do is find the 'edited' photograph somewhere in this magazine, write the number of the page on which it appears on the back of an envelope, together with your name, address and phone number, enclose the corner flash and post it to **DSE Mobile One Competition**, **Amateur Radio Action**, GPO Box 628E, Melbourne 3001.

Note that all entries submitted from last month's issue *will* be included in the draw, corner flash or no, so if you entered last time you don't need to enter again — but feel free should you so desire! (By the way, in case you looked in vain last time, grab last month's issue and turn to page 20. I jumbled the numbers on the **Icom IC-2SRA**'s keypad. Sneaky, eh?) *You* could be a winner!

Look out Uncle Sam!

Amateur Radio Action correspondent **Neil Duncan**, **VK3OK**, is in the USA as I write. Neil and madcap cartoonist **John Kolm**, **VK3YJK**, are almost as silly as each other, so I asked Neil to drop in on John in Washington DC, camera in hand, to file a report on what Kolm is *really* up to there. Look out for what promises to be a fascinating report...

I also asked Neil to drop in on **SGC**, a Washington state company (on the other side of the country!) which has advertised its very effective automatic antenna tuner in these pages for some months. I suspect that few of you are aware that SGC is actually quite a large company which manufactures a wide range of HF transceivers and every conceivable accessory item to go with them. So Neil will be visiting SGC's Bellevue, Washington, head office for a stroll along the production line. You'll find the company's new advertisement this month for one of its HF transceivers, a snazzy unit called the SG-2000, and we'll be taking a much closer look at this radio in review soon.

Curvaceous Kenwoods...

Kenwood was the first of the Big Three to present us with 'curvy' hand-held radios, but it is now far from alone. **Icom**'s new **P**-series radios (reviewed this month) also show the curves. It's a trend very probably started by the Japanese motoring companies, and seen very clearly here in such cars as **Toyota**'s Celica and **Mazda**'s 121.

But Kenwood's curves have now started to appear in other model lines, with some of its stereo equipment clearly showing the same signs. Makes you think of those crazy TV 'spheres' so popular in the mid sixties...

◀ *This is a corner flash!*

Q-*what*?!!

Our last **QSP** (I have a relayed message for you) talked about the 'Q' codes as used by amateurs. There's quite a few of them, and I'm sorry to say that many of them are used incorrectly by the majority of us, and *some* of them — well, there are some we just don't hear at all. But we need to know the codes to pass our amateur licence tests, and it's a good idea to brush up on them from time to time.

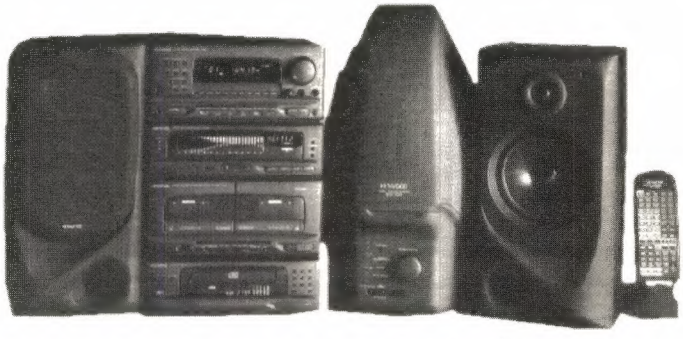
Of course, they're just the thing for our all-new **1992 AOCP Theory Course**, which begins with this issue. If you follow our course notes closely, you may well be ready to sit for your AOCP examination before the end of this year. Remember, full AOCP also needs a pass in Morse Code, so we present a number of gadgets this month which may even make Morse *interesting*, if that's at all possible. A lot of people still use Morse, and two of them have gone to great pains this month to tell us why. Sheer weight of numbers says there must be *something* to it...

Anyway, I digress. There are too many 'Q' codes to squeeze them all sensibly into this column, so turn the page for the full list. They're just the thing for the shack wall. In fact, they're perfect for when some clever so-and-so sends you a "Q-we-don't-use-this-one-too-often-but-you're-new-and-I'm-a-rat" — just reach for your list and you'll be able to fire a bucket-load of them straight back without thinking twice!

Ah, there are times when it's *fun* to be alive, aren't there?

The economy...

You could be dreadfully unkind and suggest the ascension of Mr Paul 'Banana Republic' 'The Recession We Had To Have' Keating to the Prime Ministership had something to do with it, but our dire economic forecasts (twice!) of the last three years have finally come to pass, not three weeks after the former back-bencher snatched the crown from eight-year incumbent Bob Hawke.



The Australian dollar took a sudden slide from 78 US cents to just 73 US cents on January 10, with pessimists predicting further falls to just 70 cents by the end of the month. On first look, eight miserable cents doesn't sound much. (Just ask the ABC — it really *isn't* much!) But that eight cents fall translates to somewhere in the order of 10 to 15 per cent increase on the price of imported goods — and virtually *all* of our amateur equipment is imported so we can expect to see prices start to rise soon.

While this will be great for the agricultural and export manufacturing industries it won't be much fun for amateur radio operators. In recent days the value of the $A has fallen around five per cent and is expected to go at least as far again by the end of January. Although the Reserve Bank took early steps to buoy the flagging dollar, the pundits said the sterling (!) efforts were unlikely to produce any prolonged effect on the currency.

Fortunately many of the major importers keep a bit of stock on hand so we may be insulated from the effects for a little while. However, the amateur market is comparatively very small, so total stock numbers are relatively few.

While economic forecasters were producing such delightful gobbledegook as "...the early free fall phase...", the importers were more down-to-earth in their observations:

Stewart Day, VK3ESD, managing director of **Stewart Electronic Components**, said that with new shipments arriving at new lower values, prices would have to go up. "It is unavoidable," he said. "We have had quite stable currency conditions for some time now and most prices have been stable for close to two years. However the 'slop' we had built in has now been used up, and we will have to re-assess our position on a day-by-day basis."

With the Australian currency reaching a four-year low against the US Dollar, and also suffering substantial and equally-important falls against the Japanese Yen, it would seem inevitable that price rises *will* occur.

You tell me when...

73 until next time to you and yours from **Chris Edmondson, VK3YID.**

NEWS DESK

Readers' contributions invited

Write to GPO Box 628E, Melbourne 3001

'Q' up for these...

In last month's QSP, editor Chris Edmondson threatened to run a full list of the 'Q' codes as used by amateurs. Of course, if he *really* presented the codes as most of us mis-use them, he'd probably get flooded with complaints, so here are the codes as we're *supposed* to use them...

How many did you get right?

QRG Will you tell me my exact frequency (or that of...)? Your exact frequency (or that of...) is ... kHz.

QRH Does my frequency vary? Your frequency varies.

QRI How is the tone of my transmission? The tone of your transmission is... (1. Good; 2. Variable; 3. Bad)

QRK What is the intelligibility of my signals (or those of...)? The intelligibility of your signals (or those of...) is (1. Bad; 2. Poor; 3. Fair; 4. Good; 5. Excellent)

QRL Are you busy? I am busy (or I am busy with...). Please do not interfere.

QRM Is my transmission being interfered with? Your transmission is being interfered with... (1. Nil; 2. Slightly; 3. Moderately; 4. Severely; 5. Extremely)

QRN Are you troubled by static? I am troubled by static... (1-5 as under QRM)

QRO Shall I increase power? Increase power.

QRP Shall I decrease power? Decrease power.

QRQ Shall I send faster? Send faster (...wpm).

QRS Shall I send more slowly? Send more slowly (...wpm).

QRT Shall I stop sending? Stop sending.

QRU Have you anything for me? I have nothing for you.

QRV Are you ready? I am ready.

QRW Shall I inform ... that you are calling him on ... kHz? Please inform ... that I am calling ... kHz.

QRX When will you call me again? I will call you again at ... hours (on ... kHz).

QRZ Who is calling me? You are being called by ... (on ... kHz).

QSA What is the strength of my signals (or those of ...)? The strength of your signals (or those of ...) is ... (1. Scarcely perceptible; 2. Weak; 3. Fairly good; 4. Good; 5. Very good.)

QSB Are my signals fading? Your signals are fading.

QSD Are my signals mutilated? Your signals are mutilated.

QSK Can you hear me between your signals and if so can I break in on your transmission? I can hear you between my signals; break in on my transmission.

QSL Can you acknowledge receipt? I am acknowledging receipt.

QSM Shall I repeat the last message I sent you, or some previous message? Repeat the last message which you sent me [or message(s) number(s) ...].

QSN Did you hear me (or ....) on ... kHz? I heard you (or ...) on ... kHz.

QSO Can you communicate with ... direct or by relay? I can communicate with ... direct (or by relay through ...) .

QSP Will you relay to ...? I will relay to ... *(...all ARA readers? Ed.)*

QST General call preceding a message addressed to all amateurs and ARRL members.

QSU Shall I send or reply on this frequency (or ... kHz)? Send or reply on this frequency (or ... kHz).

You'll find the rest of the 'Q' codes on page 8.

NEWS DESK

QSV Shall I send a series of Vs on this frequency (or on … kHz)?
Send a series of Vs on this frequency (or on … kHz).
QSW Will you send on this frequency (or on … kHz)?
I am going to send on this frequency or on … kHz).
QSX Will you listen to … on … kHz? I am listening to … on … kHz.
QSY Shall I change to transmission on another frequency?
Change to transmission on another frequency (or on … kHz)
QSZ Shall I send each word or group more than once?
Send each word or group twice (or … times).
QTC How many messages have you to send?
I have … messages for you (or for …).
QTH What is your location? My location is …
(**QTH-R**: Location as per *Call Book*)
QTR What is the correct time? The time is…

You can find the Q Codes in major reference works such as the **ARRL Handbook** or most national call books.

MFJ announces lots of new goodies

MFJ Enterprises, represented in VK by the nice people at **Stewart Electronics**, has announced a whole raft of new goodies for 1992. *(They're coming out by raft because freight went up when the dollar went down. Ed.)* These include some wonderful versions of the SWR analysers for commercial users and also one with a built-in frequency counter. A 20 metre QRP transceiver, lots of VHF portable antennas and many new accessory lines are also coming our way. Watch out for details very soon!

Write for ARA!

The tireless **Geoff Hudson**, **VK3VR**, who has prepared the **Amateur Radio Action** ***Contests*** and ***Foxhunting*** columns for the past couple of years, has reluctantly asked **News Desk** if it could help find a couple of people to replace him on the editorial desk. Geoff's workload has reached the point that he can no longer be sure he'll have enough time to prepare his columns. We're sorry to see you go, Geoff, and we're grateful for your sterling efforts.

Before we had a chance to press-gang a couple of likely replacements, though, one mad fool actually came to us to *volunteer* for the Contests hat! We'll introduce said volunteer next month, but that still leaves the foxy side of things to sort out.

In fact, **News Desk** wonders if anybody would like to see any *other* columns introduced to the magazine. How about a **state-by-state summary** of what's on, a **club news segment** or something else you've been looking for? The editor is always keen to hear from you if you have something to suggest — *particularly* if you're going to dob yourself in for the task!

The editor's phone is always manned (admittedly, that's because he leaves the answering machine on a lot of the time, but he *does* return the calls!), and the best time to try is between around 10am to 6pm Eastern time on (03) 601 4222. Alternatively, try (018) 35 3599 after 7pm only Monday to Saturday or any time Sunday.

Hy-Gain is back!

The renowned range of **Hy-Gain** antennas is once again available in this country, following the appointment of Sydney-based **Firemoon** as sole Australian agent for the entire range.

For 1992, Hy-Gain's range includes both beam antennas and verticals — the company is particularly well-known for its monobanders, although it offers a complete range of multi-band beams, and the verticals are also multi-banders.

Call Rod Craig at Firemoon on (018) 64 1553 for more information.

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1992 Gosford Field Day...

The annual Gosford field day will be held at the Gosford Showground on Sunday, February 23. An early start (0800k — ouch!) should have the blood circulating well and truly by the time all the bargains are wheeled out.

Gosford is one of the survivors of the amateur radio calendar, and this year's meeting marks the 35th consecutive holding of the event. It's acknowledged as Australia's biggest amateur radio turn, and *every*body who's *any*body goes. Well, we can't ignore something like this, can we? Yon editor plans to go this year, so be ready to show off, Gosford — he doesn't drive *that* far without a darned good reason...

Of course, the well-known suppliers of electronic equipment, components and books will be attending the event. These companies plan to have their latest products on display *(only if they get them back from me first! Ed.)* and there will be *mountains* of everything for sale — much of it at special field day prices. Bearing the current value of the dollar, Gosford 1992 may well be the last opportunity for you to grab a real bargain or two...

Event organiser, the **Central Coast Amateur Radio Club**, has changed the format of the day in line with the changing face of amateur radio. In recent years seminars on a wide range of topical subjects have been a popular attraction. And this year, an even *bigger* program of topical and interesting lectures and equipment displays have been arranged.

Some things, however, simply don't change, and those with pre-loved bargains as well as those who enjoy fossicking through such items will discover that Gosford will be renamed Nirvana for the day.

We trust there will be a talk-in. There had *better* be, or VK3YID will end up slowly circumnavigating Ayers Rock and wondering where the devil he went wrong. Look for the local two metre repeater...

Scout Mud-fest...

We could have told you, you know. Every Scout Jamboree gets a good drenching at the start. It's traditional. The idea is to set up *after* the rain has gone. Evidently they forgot to tell the intrepid team of radio operators who set up a really nice station at the site of Australia's latest Scout Jamboree, held at Ballarat in Victoria earlier this month.

Just one day before it got running seriously, some very unseasonal weather arrived and dumped several inches of rain on the site in a matter of hours. Inches hell! Try *kilometres*. One frazzled operator reported some rather damp water in the station tent was inconsiderately lapping right up the legs of the main operating table at one stage — it even rated a mention on broadcast radio in Melbourne.

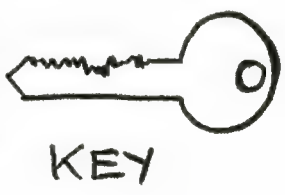
You can come out now, fellas. The Jamboree is over so the weather's on the improve...

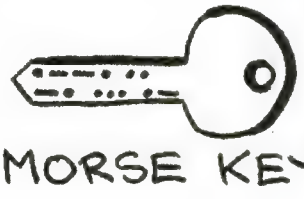
There's no news. It's *official*...

Editor **Chris Edmondson** was invited to park in front of the WIA Victorian Division's broadcast microphone for the last **VK3BWI** news broadcast of 1991. Why not, we thought? He had to laugh inwardly, though, upon discovering that his last item was one to say that broadcasts would not resume until February, as "there's no news over the Christmas / New Year period, so there's no point having a broadcast".

Well, I like the logic, even if **Amateur Radio Action** keeps churning along every fourth Tuesday, holidays notwithstanding. And it's equally clear that nobody thought to tell the NSW Division that the world closes down for Christmas — its broadcast of January 5, 1992, featured an absorbing 15-minute discussion about Roman numerals on clock faces! Should it be **IV** or **IIII**?!!

Hmmm. Maybe those Vics *were* right after all...





NEWS DESK

Icom IC-P2AT and IC-P4AT
handheld transceivers

By Tom Moffat, VK7TM,
Fern Tree, Tasmania

*Is this the way of the future? Icom's exciting new P-series explode the old 'small-is-dumb' thinking with so many features that a new approach is needed to keep it all under control. How does **AI** — **A**rtificial **I**ntelligence — sound? For this month's cover review, we sent both the two metre and 70cm Icom twins to Tom Moffat for a closer look...*

Icom's latest HTs are the **P-series**. That's **P** for Pretty-damn-small, **P** for Puny, **P** for Probably the smallest Package Icom has yet Produced. So P-Play it again, P-Porky!

Amateur Radio Action readers have already seen these radios, with their first official release in the **Stewart Electronics** catalogue late last year. There they sat, amidst all the traditional sleek black hardware — fat, squatty, and *grey*. When I first saw those pictures I was reminded of the $10 walkie-talkies my kids got for Christmas a couple of years ago; little grey CB sets moulded to look like carphones with fake pushbuttons on the front. *(Not a bad try, Tom, but don't you think they're a bit juvenile for 20-year-olds?!!. And ten bucks, eh? You wasted your dough — I know where to get 'em for eight... Ed.)*

The problem with the new Icoms is that they just don't seem to photograph well. So don't be deceived by the pictures. When one of these little radios hits the palm of your hand you *know* they mean business. Nothing cheap and crummy here. They are as solid as a rock — the front half of the case seems to be made of shatterproof ABS plastic; the back appears to be of metal, probably to act as a heatsink for the transmitter.

The knobs and antennas are of grey rubber and the innards appear to be more-or-less sealed. Icom says the P-radios are 'splashproof'. I guess that means you could carefully use them out in the rain or in a boat. I wasn't game to give them a drenching, but if they are water resistant they would be the ideal sets for bushwalking or search-and-rescue work. *(Virtually all modern HTs are water resistant, Tom. Look for the rubber seals under the rotary switches. Ed.)*

Being grey, or any non-black, is a real departure from the 'my radio is like your radio' idea in the amateur handheld market. As I said it looks odd in pictures, but in real life the grey color sort-of grows on you. And the white buttons and labels stand out nice and clear — *far* better than on black radios. The whole color business is like cameras, I guess. All cameras used to be black until somebody like Minolta came along with bright yellow cameras which could be used in blinding rainstorms.

Maybe since Icom has broken with tradition, they should look at something like bright yellow radios for rough and ready work. Seriously. You'd never lose one in thick scrub, or at night. *(One of the smaller Japanese companies actually does that, Tom. Choose black or bright yellow... Ed.)*

The display on the P-series is BIG, very similar to the display on Icom's IC-W2A model. It's mounted in the dead center of the radio with the keyboard below it and the combined speaker-mic above. There appears to be a magnifying lens to make the characters look even bigger, and it's even possible under software control to vary the contrast of the LCD display. I found it VERY easy to read, even without my glasses.

The speaker/mic departs from the traditional grille style. It's mounted behind a depression with nine holes drilled in it to let the sound in and out.

This, I think, is what gave me the first impression of 'toy radio' when I saw it in pictures, but this speaker arrangement now seems to be popular in the expensive cellular telephones being sold into the up-and-coming yuppie market. Oh well, one must keep up with the current style, I suppose...

The new Icom P-series comes in two flavors, VHF and UHF, as the **IC-P2AT** and the **IC-P4AT**. Apart from obvious things like frequency coverage and the battery drain of the extra transmit stages in the UHF version, they are identical in every way; they even share a common instruction manual. Physically, the only way you can tell the models apart when they're turned off is by the size of the antennas. So from now on, when referring to 'the radio' or 'it', we're talking about both versions unless stated otherwise.

The P-series batteries no longer hang on the bottom of the radio. The smallest battery at least fits *INTO* the bottom, behind the keyboard, in a similar manner to the latest Kenwood HTs, seen in this country as the TH-27A. With its standard battery the transmitter can deliver 1.5 watts. Battery life isn't remarkable, though, with 3 hours 40 minutes specified for the VHF version and 2 hours 40 for the UHF. But on test, receiving most of the time, I found their running times adequate.

The larger batteries fit partially into, and partially outside the radio, so the set would be somewhat taller and heavier. With the big 12 volt battery the radio will deliver 5 watts, but the operating time comes back to 2 hours 40 minutes on VHF, and just two hours on UHF. The transmitters on both VHF and UHF versions worked well, bringing in excellent signal and audio reports, on both their high and low power settings.

In operation, I found the P-series very similar to my own IC-24AT dual-band HT. The keyboard layout is nearly identical, and functions such as skip, memory/VFO, set, and duplex fell in the same places. When I first began using the Ps I instinctively hit them with IC-24AT commands and most of them worked. You go through the same motions on the P-series and the IC-24AT to set a frequency, to program a memory, or to select duplex operation.

On-air there are similarities as well; for instance on aircraft signals the IC-P2AT shares a funny little quirk with the IC-24AT in that the S-meter refuses to move above about S2 even on the *strongest* signal. This has no effect at all on performance, it's just unusual. I suspect both radios share the same IF design, and their microprocessors obviously came from the same stable.

But there are some major differences, such as in the memory department. The P-series has **100 memory channels** which is an *awful* lot for a handheld. But the radios have significant receiving coverage outside the amateur bands, so the extra channels would certainly be useful. However, all but the first 10 memories are somewhat abbreviated.

Channels 0-9 can store frequency, duplex information, duplex offset, tone squelch frequency, tone encoder and squelch information, and frequency-skip information. The higher memory channels do not store the duplex offset nor the tone squelch frequency. This may not sound important, but consider the following situations:

There are many repeaters on the marine VHF band around 156 MHz. When monitoring these channels it is convenient to be able to listen on the input frequency to determine if the boat you hear through the repeater is near you. The 'monitor' button on the radio does this nicely. But offsets on the marine channels aren't the common 600 kHz of the amateur service, they're more like 4.6 MHz.

The older IC-24AT can store the correct offset with every one of its memory channels. But with the P-series, on all channels other than the first 10, the radio uses whatever is the current offset in the VFO. So you must manually reset the offset to 4.6 MHz before listening on the input of marine repeaters. And you must reset it back to 600 kHz for amateur repeaters.

(That's only half the problem, Tom. If you look again you'll discover that you can program and store a duplex offset in those first 10 channels okay — but if you're outside the amateur allocation hitting the 'monitor' button won't put you on the input channel anyway! The CPU seems to ignore duplex information outside the amateur bands. The same thing happens on the IC-W2A as well, which is a shame. At least the P-series radios offer sufficient memory channels to put commercial input and output pairs on adjacent memories should that take your fancy, but it could detract somewhat from the overall appeal if you're a 'scanner' buff. Ed.)

As for tone-squelch frequencies, the original purpose of tone-squelch was to allow two radio services to share the same channel without having to listen to each other's traffic. If there are two services on the same channel and at times you would like to listen to one or the other but not both, the way to do it is to assign each service to its own memory in the radio: say the trucking company with a tone frequency of 123.0 Hz to memory channel 15, and the dairy company with a tone frequency of 91.5 Hz to memory 16.

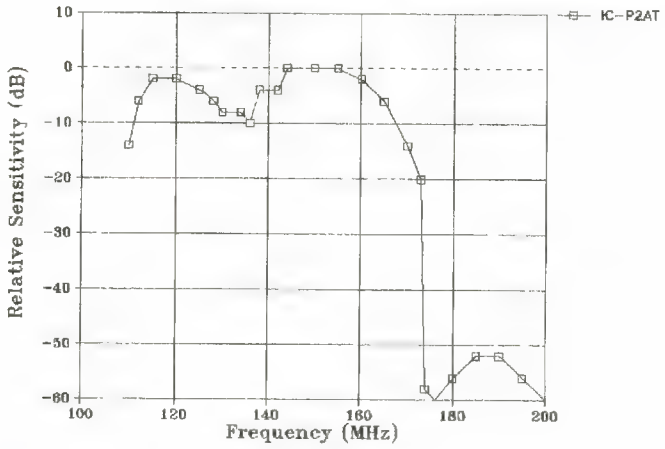
For all practical purposes these are now two discrete channels, although both share the same RF frequency. But if you can't store two individual tone-squelch frequencies, the trick won't work. This might not seem too important now, but the time will come when amateur repeaters will carry tone-squelch so more than one can share the same frequency in the same area. *(While there's no doubt that CTCSS is the rising star of VHF and UHF amateur radio, I very much doubt that this system would ever be used for repeater channel-sharing in Australia, Tom. How could you prevent one repeater from transmitting when the other was on air? And if you did manage that, what about the priority of a distress call? Ed.)*

The higher 90 channels will be fine for more conventional uses, such as storing simple scanner frequencies where no tone-squelch or duplex is required. And the first 10 memories can store everything.

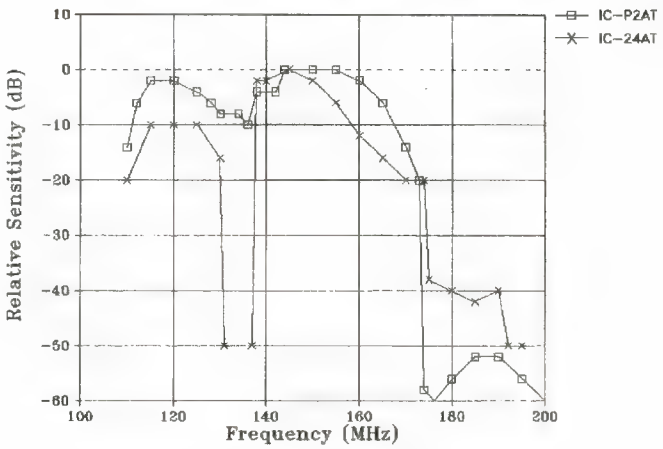
The P-series radios have excellent scanning capabilities. There is the usual memory scan — no problems! — along with unlimited and programmed scanning of the VFO. A most useful feature is frequency skip scan, where the radio can be programmed to ignore certain frequencies while scanning. This is becoming more and more useful as radio systems become more sophisticated.

I set up the IC-P2AT to do a programmed scan between 160 and 165 MHz. But many radio services which used to produce words to listen to, now let fly with digital blurts instead. At least one of Hobart's taxi services has gone this way, and more will surely follow. So it's goodbye to the **Moffat Taxi Test** of HT sensitivity. *(Oh, thank goodness!! Ed.)* There are other services emitting continuous streams of data; I wouldn't have a clue what they are. It was nice to be able to exclude these nasties from the programmed scan. The radio stores the no-no frequencies in its upper memories, starting at 99 and working backward.

Icom IC-P2AT Receiver Performance



Icom IC-P2AT vs. IC-24AT



On the air

On the amateur bands the radios did exactly what was expected of them. As mentioned above, transmitted signals were clean as a whistle with a nice smooth sound. Receiving within the amateur band was fine too; I set the IC-P2AT and my IC-24AT on a table, side by side, with both tuned to a weak distant repeater. Reception was excellent in both cases; I couldn't tell them apart.

Receiver operation is possible outside the amateur bands, although it's 'unofficial' in Australia and performance is not guaranteed. But it seems Icom engineers have been working away to improve out-of-band reception regardless. As shown by **Figure 1**, directly above, full sensitivity is maintained out past the 156 MHz marine band on the VHF radio, starting to fall off at 160 MHz. Sensitivity decreases further until 174 MHz where it takes a suicide plunge.

At the other end of the range, performance on the aircraft band is first rate. And, as with the IC-24AT, the receiver responds to true AM, not some imperfect form of FM. Beginning at 117 MHz, sensitivity is only a couple of dB below the best FM performance, and it continues with reduced sensitivity right up to 138 MHz at which point the receiver switches to FM.

The IC-P2AT's wideband receiver performance is a big improvement on that of the IC-24AT, as shown by **Figure 2**, opposite column above. Above the amateur segment the IC-24AT begins falling quickly, rejoining the curve of the IC-P2AT before they both collapse in a heap. But in the area of 160 MHz the IC-P2AT is clearly superior. In the aircraft segment below two metres the IC-24AT is 10 dB below best FM performance, while the IC-P2AT is only 2 dB down. In practice, this means that from my home the IC-P2AT can hear aircraft on the ground at Hobart airport while the IC-24AT can only hear the tower and aircraft in the air.

Between 132 and 138 MHz the IC-24AT's PLL drops out, causing a big hole in the coverage spectrum. The IC-P2AT keeps going here, although there's not a lot to listen to other than weather satellites. And they're on FM, while the IC-P2AT is still receiving on AM.

On UHF, the IC-P4AT's receiver seemed to work as high as the police frequencies around 468 MHz, although it was a bit deaf here. In the big cities this should be no problem because the police base stations are usually mounted up high and they run lots of power. The CB channels around 476 MHz were completely non-existent on the review transceiver. Performance improved going downward from 468 MHz until it became first class in the amateur band. Bear in mind that *ANY* reception at all outside the amateur bands is a free gift to you from Icom, since the radios are not specified to work here at all.

(You may also find receive coverage between about 800 and 950 MHz, extending in some units to over 1000 MHz. Ed.)

'Artificial Intelligence'

Now for something *completely* different, as they say. The P-series has a prominent button on the front panel marked '**AI**'. This is green in color, and in stark contrast with everything else there. It's obviously *meant* to stand out. The button has several functions which may or may not be useful, depending on your point of view.

In its simplest form, the AI button acts as a last-command stacking register. It 'remembers' the last operational command you used, such as duplex or priority or scan. The name of the command is shown in the lower right corner of the display, and if you press the AI button that command is executed. So if you use the scanner a lot you can turn it on and off with the AI button.

But the command storage goes a bit deeper than this — the radio actually remembers the last *few* commands, in the order used. You can cycle through them by pressing AI and then turning the tuning knob. This is intended to make it easy for you to access the commands YOU use most frequently; in other words, it customises the radio for your own operating style.

It is possible, by holding down a couple of buttons and turning on the power switch, to make the AI button manually programmable. You can then set it up so it produces your one favorite function all the time; for instance, if you use the priority function a lot, you can turn it on and off every time you press the AI button.

If you don't want the AI button's function shown in the corner of the display all the time, you can select instead, a digital clock. This sits there ticking away in the corner display in an unobtrusive manner. And, unlike clocks in so many other radios, the one in the P-series actually keeps accurate time. (I just looked at the clock in my IC-24AT and it's 11 minutes out. Ah, well.) The clock can also be programmed to turn the radio on and off at a particular time.

Seeing stars...

Part of the radio's AI system sets up several levels of operation, presumably dependent upon the user's level of

expertise. The level is very prominently indicated on the display by a series of one to five stars along the top. At the 'expert' level, with all five stars showing, the display looks like General Schwartzkopf at one of his Gulf War press conferences.

At the one-star level you are only allowed to operate the scanner and bring up the clock onto the display. Two stars add the ability to change things relating to the tone and code squelch, turn duplex on and off, and do simple things with the SET mode. Three stars adds priority watch operation to your list of privileges. Four stars adds skip and memory mask functions, and five stars gives you the lot, including the complicated bits of the set mode.

Information on how to change the star numbers, and hence the level of privilege, is contained in a small booklet separate from the main instruction manual. So the casual reader of the manual can see what the radio is capable of doing, but he can't make it happen if his 'star-level' is too low.

There are two ways of establishing a user privilege level. By holding down the correct buttons and turning on the radio you can then select the number of stars manually. The other way involves a little test which is supposed to measure the potential user's level of expertise.

You press the light and AI buttons together and then turn the radio on. The display then shows a question number, and the choices **YES** and **NO**. Within the auxiliary instruction manual is a list of questions which you must answer by turning the radio's tuning knob to select YES or NO. Your results in this little exam determine how many stars you are awarded at the end.

Some questions are moderately technical — "Frequency is measured in Hz?" ... or ... "Transmit power is measured in microvolts?". Other questions are more obscure: "You like to be punctual?". You would always have clock privileges no matter how you answered this one since only one star is required for the clock.

(You may also be amused to see one of Icom's latest promotional brochures which I've scanned in here for you. This thing richly deserves an Editorial comment or two — but instead you get a Kolm cartoon. Ed.)

On my first run through I answered the 15 questions in the way I thought the radio wanted and was awarded five stars (Look what I got today, Mummy!). I then ran through the questions again, this time giving the opposite to the answers I thought the radio expected, and bingo! *one* star. So it's obviously measuring *something*.

Is all this stuff useful, or is it just a frill? Just below the trial mode information is written in big black letters, "Please understand that the above questions are a kind of game. The results may differ from your actual knowledge." However, Icom people tell me that when they took the P-series radios to an amateur radio show in New South Wales, only three of the many people who tried the test cracked five stars...

This I find immensely worrying. What of the amateur license exam? It seems to me that anyone who passed the 'official' exam would be able to come up with five-star answers to the radio's simple little questionnaire. Yet so many people blew it! Was it exam nerves, being grilled by a walkie-talkie, or did they simply lack the most basic knowledge? It's interesting to note that even a one-star dunce is allowed to TRANSMIT on the radio. Is this the way our license system is going? (You can disable the transmitter in the set mode, but you have to have five stars to do this. The radio, when reset, comes up with the transmitter operational.)

In the ads the AI feature and the questionnaire are being promoted as the latest technical breakthroughs. But are they? First the term AI, or 'artificial intelligence': to me it seems a bit presumptuous to use the name for a simple command-stacking register. The very thrust of AI suggests the making of decisions dependent on previous events, but certainly not regurgitating information which has previously been stored in a stack.

As for the questionnaire thing, what it's actually doing is asking you to enter a 15-bit binary number, slowly, one bit for each question. Yes/no for 1 or 0. The number thus generated then determines how many stars you get. This feature is simply software, and it wouldn't have cost much to implement other than sitting down and writing a few lines of code.

But it seems that the same resources could have been better deployed to store a 15-bit number that would act as kind of a 'combination lock' to the radio's operation. Then, if the radio were stolen, somebody else couldn't come along and use it without knowing the correct 'PIN' number. Once this feature became known the radio would have very little value on the stolen goods market, and it would therefore be more valuable to its legitimate owner.

What's wrong with the P-series? Only a couple of things. I feel the receive audio could be a bit nicer; it sounds a bit tinny. I blame this on the tiny speaker. In fact the UHF set seemed to have blown its speaker altogether, with all sounds accompanied by a rattly effect. Icom tells me this was most likely caused by that same equipment show in

New South Wales, where everyone who picked the radios up insisted on turning the volume up full blast.

I can understand why they would do that; the audio output from that tiny speaker isn't all that great, and they would have tried to bring it up to overcome the general acoustic noise level of the show. The VHF radio seems to have survived this all right, although I still feel a bit of concern about the overall robustness of the speaker.

One other problem cropped up. One morning I switched on the IC-P4AT UHF radio only to find the clock reading '0:00'. Investigation revealed that the radio's microprocessor had somehow reset itself, wiping out not only the clock but the contents of all 100 memories and all of the pre-set functions. Had the memories contained anything of value it would have been a terrible job to reprogram all 100 of them. Let's hope this accidental reset was a one-off, not a continuing habit. I'm sure it wasn't caused by sloppy button-pushing; to do a deliberate reset requires you to hold down one key on the keyboard, one key on the side, and then turn the radio on.

The instruction manual is up to the usual Icom standard with most functions easy to understand. There are some little hints thrown in, such as information on how to extend the working life of a NiCd battery by using the correct charge/discharge cycles. And in the trouble-shooting section there's even a procedure for booting the P-series into the full General Schwartzkopf five-star mode without sitting the exam.

All in all, they're not bad little radios. The P-series Icoms are excellent, but not spectacular performers. They're very smooth and easy to get on with. For REAL ease of operation you could set them up in five-star mode, and then reduce your access level to one-star so you couldn't accidentally mess anything up.

I'd like to see them with more robust speakers. And perhaps better use could be made of the questionnaire business in the Trial mode. You would use that once and then forget it, I think. What about the combination lock idea? And maybe some really flashy colours, since we've gone off black at long last. Maybe bright yellow? I put that one to Icom, and they didn't exactly say no...

Amateur Radio Action thanks **Icom Australia** for the loan of the review transceivers.

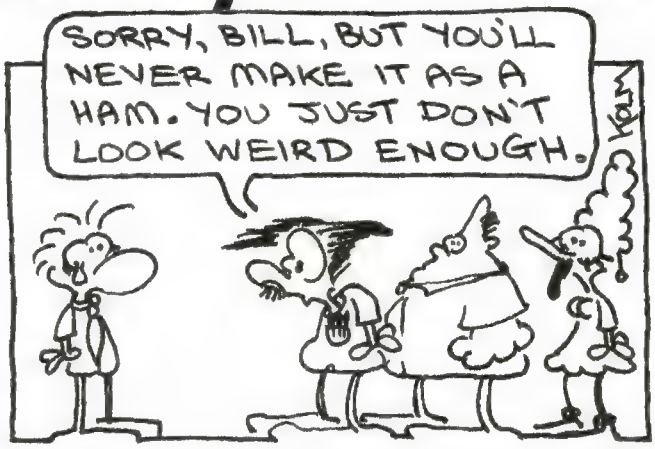
AMATEUR RADIO THEORY

1992 AOCP Theory Course

Part one

By Paul Butler, VK3DBP,
Brighton, Victoria

This is our all-new, let's-start-from-scratch, AOCP amateur theory course. With a little application and regular work, you could turn this course into a shiny new 'full call' before the end of this year. Good luck!



Welcome to 1992, the year in which you are going to take the exam for the Amateur Operators Certificate of Proficiency (AOCP) — and PASS! "Not me!", do I hear you say? "Full call *phooey* — it's *far* too hard. *AND* you have to do 10 words per minute Morse — why would anyone bother?"

Well, there are *lots* of reasons why it's worth bothering, a few of which we'll have a look at in a moment. Then, having thought about it for a while and decided to give it a go, you can get right into the action this month, with the first part of **Amateur Radio Action**'s all-new **AOCP** theory course.

Our AOCP course follows on from our Novice (**NAOCP**) theory course, which began in April 1990 and culminated in a trial exam in June 1991. There are no doubt *lots* of readers out there who were inspired to have a go for the Novice ticket and are now raring to get started on the next stage. However, if you are just starting out in amateur radio and missed out on the Novice theory course, don't despair. Consider getting the relevant back issues of **Amateur Radio Action** and doing some background reading — the full set runs from Volume 12, Number 13 (dated 17/4/90) to Volume 14, Number 3 (dated 9/7/91).

*(As a special offer until the end of next month, we'll send you reprints of the entire NAOCP theory course for only $20, which is a very substantial saving indeed. Address your request to the Editor, **Amateur Radio Action**, GPO Box 628E, Melbourne 3001)*

Why upgrade?

What exactly is the full-call (AOCP) amateur operator allowed to do that the Novice (NAOCP) can *not* do? Why spend the time and effort studying for the exam, and getting Morse sending and receiving up to a higher speed, if you already hold a Novice licence? And anyway, is the Morse *really* necessary? These are common questions and we'll have a go at answering them. In the final analysis, of course, it's YOUR decision but if you *do* decide to go ahead, you will certainly find the exercise challenging and rewarding. Isn't that enough to make you want to get started?

The first difference between a full-call operator and a Novice operator concerns the power of transmissions. A limit of 30 watts peak power is imposed on Novices when using single sideband (SSB) voice transmissions, and this is reduced to 10 watts mean power when using any other mode of transmission. The so-called **Unrestricted** (full-call) operator is, in fact, still limited in power, but the limits are substantially increased to 400 watts peak power for SSB voice and 120 watts mean power for other modes. (A fuller explanation of the difference between peak and mean power will appear later in the course.)

By way of an aside, this gives me a chance to get on my soap-box and make it clear where I stand on power levels. Modern electronic equipment copes easily with producing radio frequency power up to (and way beyond) the limits imposed on amateur radio operators. It is quite easy, therefore, as long as one has lots of dollars, to go out and buy a 'black box' to plug into the mains supply and produce the maximum power. More dollars will buy a multi-element antenna, tower and rotator and the whole lot will just about burn holes in the ionosphere in the search for yet another "5 and 20 over 9" signal report from the other side of the world. There are some who seek nothing more.

The *down* side of this, though, is that those of us who choose to radiate much less power, whether for personal, financial or technical reasons, are often swamped by the 'big boys', to many (okay, not all) of whom anything less than telephone quality does not count as a contact. Clearly, power limits are *MAXIMUM* levels, not the *REQUIRED* levels. The spirit of amateur radio, to me at least, is to experiment with ways of making contacts using the *least* amount of power, not the *most*! And it certainly states in the 'rules' that we are expected to minimise interference to other stations. How can the 'power towers' do that when they are pumping what seems like megawatts over the top of the lower power stations?

As a result of the trend to high power in amateur radio, the Novice operator certainly has to work harder to get through, but that is surely no bad thing. However, the higher permitted power levels can be of benefit if used sensibly and so that is one reason for aiming for the ultimate, the 'full-call ticket'.

The next reason is to do with the frequencies available to different classes of amateurs. A Novice operator is restricted to parts of four bands, three of them on HF and one on VHF. These have been chosen to give reasonable access

to both local and distant stations. There is real benefit to be derived, however, from having access to a wider range of frequencies, including the following:

• propagation conditions will usually favor one or two bands over the others at any particular time and so the possibilities for effective operating increase if a wider choice is available;

• certain operating modes are found on only some of the bands and so a wider choice of bands opens up new ways to communicate;

• Novice operators are also limited in the modes they may use. Even on some of their permitted bands there are many stations they cannot work;

• more frequencies available means more ways to experiment with transmitters, receivers, antennas and so on;

• contest operation can become more challenging with more bands to work, including possibilities for cross-band operation; and

• more bands mean more space, so if one band is crowded out, moving to another may help (eg. 70cm is always less crowded than two metres, and there's 30 MHz of it!).

Related to the bands available to the full-call amateur operator are the modes of operation which may be employed on them. As a Novice operator, you are restricted to telegraphy (Morse Code) and sideband or AM telephony (speech) on the novice HF bands, together with FM telephony on part of the two metre VHF band. Only by upgrading to a full AOCP (or to a Limited call) will you be able to take full advantage of all the exotic data modes such as packet, radioteletype, AMTOR, slow- and fast-scan television and so much more. This will mean more ways to communicate, more ways to experiment, more ways to enjoy your hobby.

The point often raised about telegraphy (Morse) requirements in the licensing system is addressed to some extent by the existence of the Limited call mentioned above. The holder of a **Amateur Operator's Limited Certificate of Proficiency** (**AOLCP**) must satisfy the same technical and regulations examination requirements as the full-call amateur but is not required to pass a Morse test. This no-code licence is very attractive to many amateurs as it provides access to all bands from 50 MHz upwards and all the telegraphy, telephony and data modes of operation.

One further possibility is to add together the full theory exam, the regulations exam and the five words per minute Novice Morse exam to gain the Combined (Limited plus Novice) certificate. This combines the 50 MHz and up privileges of the Limited operator with the Novice operator's access to some of the HF bands.

Whichever way you look at it, there are clear advantages in upgrading from the Novice theory level to the full theory level, which is what this series is all about. Whether you choose to go for the higher telegraphy or not is a separate issue — if you do, there will be more privileges available to you.

It is **Amateur Radio Action**'s intention to make this course more intensive than the Novice theory course. Our reasoning is that those starting out in amateur radio do not want to be blinded with science and probably prefer some time to think things over before the next part of the course comes along. Those amateurs upgrading, however, or readers going straight in at full-call level are ready to accept the challenge and will work as fast as we can make them go! So each issue's offering will be longer and more assumptions will be made about background knowledge.

In addition, we plan to give you, at the end of each major topic, a few sample questions to test your knowledge as you go along, rather than leaving all the testing to the end of the course. There *will* be a trial exam at the end, of course, but this way you can check your progress. It also gives you a chance to write in and tell us how you are going — it's good to know whether we are getting it right and, if not, what we can do to improve!

So, let us begin our all-new 1992 AOCP theory course, part 1...

Characteristics of radio waves

Because amateur radio communication relies entirely on **radio waves**, an understanding of what these electromagnetic waves are and how they behave is fundamental to the rest of the syllabus and so provides a good place to start.

Radio waves form part of the **electromagnetic spectrum**, which includes all types of **electromagnetic radiation**. Other parts of the spectrum are occupied by visible light, from red through green to blue, infra-red radiation (heat), ultra-violet radiation, X-rays and gamma rays.

Electromagnetic radiations all exhibit wave properties, behaving rather like waves in water. They have a **frequency** (**f**), equal to the number of complete waves passing a point each second and measured in **cycles per second** or **Hertz** (**Hz**), and a **period** (**t**), equal to the time taken to complete each cycle and measured in seconds. The length of each wave or cycle is called the **wavelength** and is usually measured in **metres**. Radio waves are at the low frequency, long wavelength end of the electromagnetic spectrum.

For all waves:

velocity = wavelength X frequency

For electromagnetic radiation in free space (and, to a good approximation, in air):

wavelength (in metres) = 300 / frequency (in MHz)

All forms of electromagnetic radiation are a combination of **electric** and **magnetic** fields, as their name implies, and are produced when charged particles are accelerated. They travel at the same velocity in vacuum, known as the free-space velocity, equal to 300,000,000 metres per second, but they propagate more slowly through other substances. For example, in pure water, the speed is reduced to about one-ninth of that in free space. In good conductors such as metals, the speed is even slower and this characteristic contributes to the complex behavior of electromagnetic radiation in metals.

Radio waves, like all waves, carry energy. The energy carried by a radio wave is divided equally between the electric and magnetic components. The electric field is always at right angles to the magnetic field with which it is associated, and *both* are at right angles to the direction of propagation. In a vertically-polarised radio wave, such as that produced by a vertical antenna, the electric field is vertical and the magnetic field horizontal. This is an important characteristic of the wave, since a mismatch in polarisation between the wave and a receiving antenna will seriously degrade the received signal. It should be remembered that the polarisation of a wave is often altered as it travels from transmitter to receiver, because of the properties of the layers of atmosphere with which it interacts.

The strength or intensity of a radio wave will also be affected during propagation. Even under optimum condi-

tions, the **field strength** of a radio signal, measured in **microvolts per metre**, will decrease directly with distance from the source, so that doubling the distance will halve the field strength. In practice, the reduction in intensity, or **attenuation**, will be much greater than this, because the mechanisms by which a radio wave travels from one point on the earth's surface to another usually involve energy losses. We need to look closely at these mechanisms to understand how and when signals will reach us and, just as importantly, how and when they will *not*.

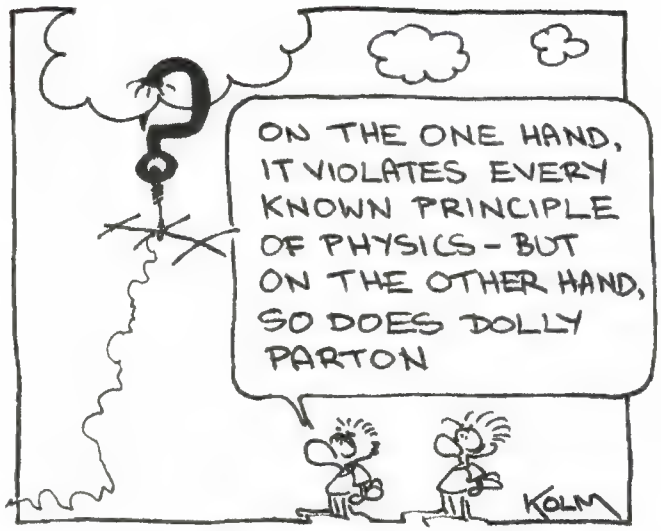
The term **ground wave** is used for waves which stay close to the earth as they travel from transmitter to receiver. A ground wave can propagate in contact with the ground or directly between two antennas arranged in line-of-sight, or it can be refracted or reflected by the atmosphere near the surface of the earth (the **troposphere**). A ground wave in contact with the surface of the earth is called a **surface wave** and such waves provide broadcast reception during daytime over distances up to about 160 km. The attenuation of ground waves is high, however, and increases with frequency, so they are of little value to amateurs except in the 1.8 MHz and 3.5 MHz bands.

Between antennas which can 'see' one another, some energy passes directly through the air from transmitter to receiver, while some is reflected from the ground on its way between the two. The waves passing along the two paths combine at the receiving antenna to produce the actual signal, called the **space wave**. The reflected component undergoes phase reversal, so that peaks are found in the wave pattern where troughs should be, and vice versa. This means that if the direct path was the same length as the reflected path, the two components would arrive 'out-of-step' and cancel one another out.

In practice, the ground-reflected path is longer than the direct path and the phase difference between the two components depends on this path difference, measured in wavelengths. At low frequencies (long wavelengths), the path difference is small compared to the wavelength and so the cancellation remains almost complete. Space wave propagation is, therefore, of little use at these frequencies.

At higher frequencies, above 20 MHz or so, when the path difference is many wavelengths, cancellation of the two components no longer occurs and so space wave propagation becomes increasingly important. Of course, this analysis is simplified. The ground-reflected wave is *always* reduced in amplitude on reflection, for example, and does not necessarily undergo a complete phase reversal, so complete cancellation is unlikely to occur at low frequencies. At ultra-high frequencies (UHF), the radio wave can be transmitted as a beam and so ground reflections are less important, modifying the analysis again. In simple terms, however, line-of-sight communication is the norm at VHF and above and an antenna which produces radiation patterns close to horizontal is required.

*While the ARA AOCP Theory course is running, we'll be offering readers a '**Pardon me**?' service. If you need any clarification of points you're unsure of, please write to AOCP Course Help, **Amateur Radio Action**, GPO Box 628E, Melbourne 3001.*



Once again, practical installations do not follow the theory exactly. Normal (or more correctly *average*) atmospheric conditions produce some bending of the space wave as it travels along. This means that it can follow the earth's curvature to some extent and so exceed the theoretical value for reception distance. This is often treated mathematically by regarding the earth's radius as increased by one-third. Using this assumption, the distance (**D**) from a transmitting antenna of height (**H**) to the horizon is given by:

D (in kilometres) = 4.124 X √H (in metres)

For any pair of antennas, then, the maximum distance between them will be equal to the sum of the distances **D** for each separately.

Atmospheric conditions, however, are often far from 'normal' and the actual distance of propagation can far exceed even this theoretical value. Weather conditions in the lower atmosphere can increase atmospheric bending by significant amounts at frequencies of 50 MHz and above. Often the atmosphere becomes layered or 'stratified', so that refraction and, in some cases, reflection, occurs at the boundaries between layers. A common cause is **temperature inversion**, in which the temperature increases with height instead of decreasing as normal.

Such conditions are usually transient, lasting hours or even minutes, and are subject to seasonal or time-of-day variations. In the tropics, temperature inversions may be present almost continuously and can trap radio waves between the boundary and the earth's surface. The waves then travel along the 'duct' over the horizon, sometimes for many hundreds or even thousands of kilometres. The lowest usable frequency for **ducting**, as it is known, may be in the UHF or SHF (super-high frequency) region of the spectrum but will sometimes come down to the VHF region and may be confused with tropospheric propagation.

That's all for this issue. More next time on the **sky wave** and **ionospheric propagation** — just what the HF enthusiasts need! Then there will be some questions on propagation, to see if you are keeping up. Stay with us over the next few months and you too can join the ranks of the full-call amateurs!

73 from Paul, VK3DBP.

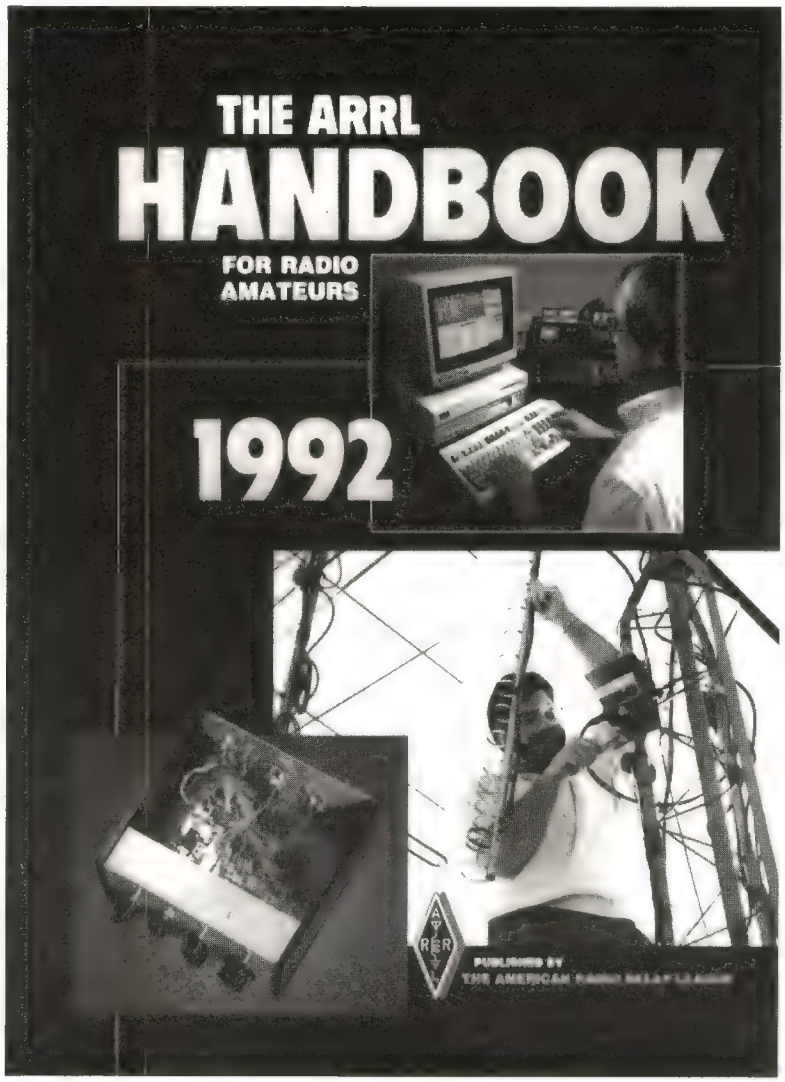
BOOK REVIEWS

Several reviews by Neil Duncan, VK3OK, and Ash Nallawalla, ZL4LM/VK3CIT.

The ARRL Handbook For Radio Amateurs

The 1992 (69th) edition. Published in 1991 by the American Radio Relay League, Newington, Connecticut, USA. ISBN 0-87259-169-7. Review copy supplied by Stewart Electronics. Recommended Australian retail price $52.90

Yet again, a new year has arrived. How depressing. That means my amateur gear is one more year older, should I ever wish to sell it. Likewise, my car is an older model by one year and, of course, my prized 1991 edition of *THE* Handbook is a year out of date. What other publication goes by the nickname of '*The* Handbook' by the way? The one I am referring to looks like a ream-and-a-half of A4 paper and contains more than enough reading to satisfy the most ardent reader in our hobby.



At a weight of over 5 kg, and of length now slightly exceeding 2000 pages *(that's <u>two</u> reams if it's printed on both sides! Ed.)*, the 1992 edition of the **ARRL Handbook For Radio Amateurs** is an imposing and hefty looking black slab — and one which is awkward bed-time reading. To myriads of radio amateurs though, this book was (and is) the pathway to our 'tickets'.

There is more than enough theory and practice covering every imaginable technical topic to satisfy any level of amateur licence.

On the other hand, for the seasoned old-timer there is also a vast array of reading on a higher level. Merely *opening* The Handbook at any random page is sufficient proof of the excellence of this ARRL gem. Here, on page 31-17, is the most modern of 144 MHz transverters. A simple but excellent HF receiver is on page 30-7 and on page 15-5 we have a page of mathematics for the amplifier builder. The list goes on...

So what's new in this edition? Quite an update in the RTTY and AMTOR sections are noted, special theory on operational amplifiers and, would you believe, the biological effects of RF energy top the 'theory' list. For the construction enthusiasts, you may care to peruse the specifications, circuit and building data on an HF linear amplifier using 3-500Z valves, an HF noise bridge, mobile antennas for VHF/UHF, a CW transceiver for 20 and 30 metres and a transverter and amplifier for the 23 cm band.

There are numerous modifications to existing material, some of them no doubt brought about by the request at the back of The Handbook for readers suggestions, and extra sections and paragraphs embedded throughout the text. Satellite projects, items on microwave links, excellent antenna tuner projects, ATV ideas, moonbounce and many recent aspects of our hobby (packet radio being a prime target) receive special attention.

Does it matter that The Handbook is an overseas product? Not a lot is lost on we amateurs in Australia. 220 MHz construction articles, for example, won't interest us too much — but the techniques used in them probably will. The outstanding quality of the text, the vast number of crystal clear photographs and the excellent circuit diagrams (they use good old-fashioned symbols for resistors and don't muck around with that silly 'n' notation for capacitors) are a joy to read.

Should you wish to buy 39 chapters of excellent amateur radio theory, practice and of construction articles for the first time, the ARRL Handbook For Radio Amateurs represents superb value. Should you wish to upgrade from an earlier edition of, say, a couple of years back, then the price asked represents good value. Upgrading your Handbook every year is probably a luxury, but one which is still possibly worthwhile.

There are some things in this world which remain pillars of wisdom and stand the test of time. For me, they include Mr Spock from Star Trek, Mozart's music and the excellence of the ARRL Handbook For Radio Amateurs (though I don't equate these!). I thank Stewart Electronics for lending me the superb 1992 Handbook, especially since I am writing this review late in 1991. You haven't got the race results for next year too, have you?

ND

The ARRL Antenna Book

The 1991 (16th) edition. Published by the American Radio Relay League, Newington, Connecticut. USA. Review copy supplied by the ARRL. ISBN 0-87259-206-5. Recommended Australian retail price $40.00.

For some time now, I have held ARRL publications in awe. When I say 'for some time', what I really mean is for a very long time indeed and when I say 'in awe', I really mean that too. There has been THE handbook, reviewed above in its latest guise, various special mode books and the ARRL Antenna Book to mention just a few. Each is special in that it really is not only the best in its field but it is aimed directly at the radio amateur — and is professionally presented. The ARRL Antenna Book has been around for more than 50 years now and has graced the shelves (although often in very thumbed-through form) of many, many shacks for all that time.

The 1991 version of the ARRL Antenna Book is on review here. It is more like a telephone book in appearance than a book for the amateur radio enthusiast. It is about 730 pages in length, sports a bright orange (soft) cover and contains 28 major topics arranged by topic. I feel it is worth listing all of them for you, to give some idea of the scope of the work:

1. Safety
2. Antenna Fundamentals
3. The Effects of the Earth
4. Selecting your Antenna System
5. Loop Antennas
6. Antennas for Limited Space
7. Multiband Antenna
8. Multi-element Arrays
9. Broadband Antenna
10. Log-periodic Arrays
11. Yagi Arrays
12. Quad Arrays
13. Longwire and Travelling Wave Antennas
14. Direction Finding Antennas
15. Portable Antennas
16. Mobile and Maritime Antennas
17. Repeater Antenna Systems
18. VHF and UHF Antenna Systems
19. Antenna Systems for Space Communications
20. Antenna Materials and Accessories
21. Antenna Product Suppliers
22. Antenna Supports
23. Radio Wave Propagation
24. Transmission Lines
25. Coupling the Transmitter to the Line
26. Coupling the Line to the Antenna
27. Transmission-line and Antenna Measurements
28. Smith Chart Calculations

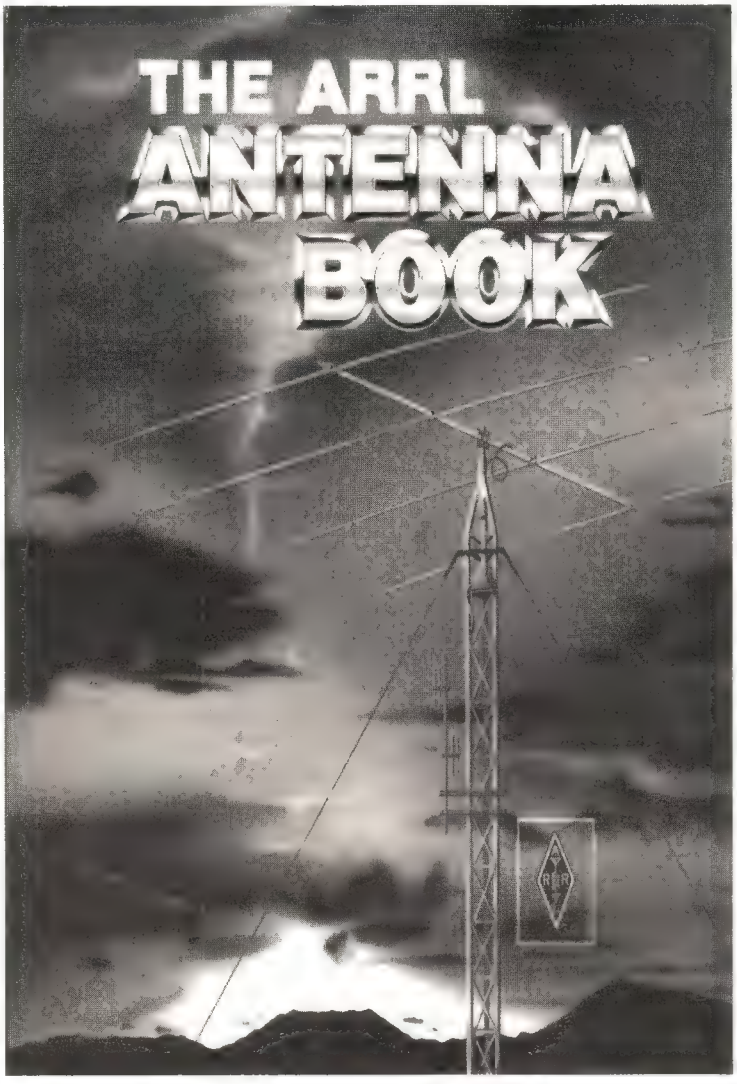
Every single page includes at least one diagram. Many have several diagrams and some even have a few photographs. Needless to say, everything is spot-on and the reader is left to guess nothing. While the mathematics is fully laid out for you and while theory dominates the text, all of the practical aspects you would want to see are there, too.

If you want to know about dipoles, bazookas, satellites, quads, transmission lines, VHF or UHF arrays, devices to (electronically) check your coax cable for breaks or even kinks, direction finding, beams, wire antennas mobile, portable or virtually *any* antenna-orientated topic, it will be there. Then again, the 14 pages of index may well help you if a flip-through doesn't.

There are so many ideas that the reader is sometimes left with a spinning (no, not rotating!) head! Randomly opening the book anywhere will introduce a new idea it seems — I'll try... here on page 22-13 (chapter 22, page 13) we have the lengths of guy wires you should avoid if you're to keep clear of resonances in the amateur bands. UHF coax cables are compared on page 24-19. On page 14-13 we have a direction-finding device for 80 metres. A two metre portable quad, depicted on a picnic table in the bush is on page 15-9.

The latest in HF Yagis, indoor and hidden antennas, azimuth and elevation control for satellite antennas, materials to use and putting antennas up in the air — the list seems endless.

What is new to this edition? Well, for a start, the quality and size (210 mm x 270 mm) of the paper is far higher than ever before. But otherwise, it is a bit hard to tell as the new work is sprinkled right throughout the book, not just tacked on at the end of each chapter. Some of the material is the same as it was in 1948, we are told. But such recent goodies as the computer programs, construction articles from a 1988 and later editions of QST and brand new instrumen-



tation based on very recent ICs and the like are give-aways of the latest upgrade.

Once again, I am in no doubt about the utility and excellence of this ARRL product. It you want an outstanding source of reading about antennas and related topics and theory, plus a resource of how to build antennas (even if American bits and pieces are often called for) then seriously consider this book for the shack. Upgrading an older edition to this one would prove worthwhile too — even if only to have a book which is not quite so thumbed through!

A loud recommendation for a top-quality reference book.

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The ARRL Radio Buyer's Sourcebook

First edition. Published by the American Radio Relay League, Newington, Connecticut, USA. Review copy supplied by Stewart Electronics. ISBN 0-87259-345-2. Recommended Australian retail price $30.

One of the obvious joys of being on the review team for **Amateur Radio Action** occurs when a new piece of radio equipment in trundled into the shack — along with the editor's instruction to 'evaluate it'. To become familiar with an interesting piece of new gear is really an enjoyable experience. Without such a pleasurable work-task, I would either have to rely on looking at new gear in the glass display cases in the radio-shops (the words "don't touch" usually appear on a card next to it) or I would have to resort to reading reviews of the gear in the appropriate magazines.

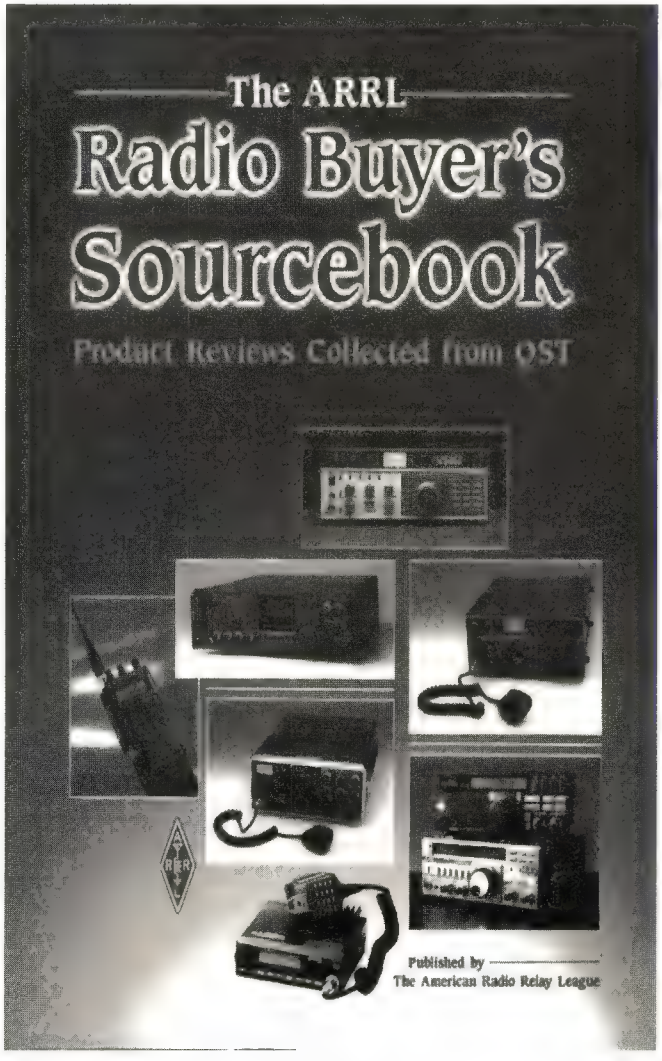
Indeed, the HF rig I own and which is sitting next to me in the shack at the moment, was purchased as a consequence of reading a magazine rig-review. The fine line between being a CW rig and being an SSB rig in the review was sufficient to sway me. *(I seem to recall you wrote the review in question, didn't you, Neil? Hi! Ed.)* For many people, the reviews they read are of great significance in their decision-making process.

So where are these reviews? **Amateur Radio Action** is, of course, the prime location for potential Australian purchasers. Don't forget, the majority of amateur gear incorporates some form of tailoring for the country it is intended for. The 70cm band coverage and the legal limit power levels allowed on HF are two clear examples of parameters subject to tailoring for Australia. The two Australian amateur radio magazines (the other occasionally sports jottings on the topic, I am told), become the most valid of sources, therefore.

Overseas magazines are intensely authoritative sources of information on the subject nevertheless. For me, QST is the best of these. Once a month, I sneak into the appropriate high-expense section of the local newsagent, carefully find the QST review pages and speed-read the latest rig review before people notice. You see, I find rig reviews one of the most fascinating items in such journals. Just considering the increase of standards, facilities and sheer innovation in our market over the last 10 years is sufficient to daunt the dabblers of our hobby.

This is where the book under review comes in. About 140 reviews from the pages of QST have been collated and presented in book form for the enthusiast to read, browse through and possibly even drool over. The book presents chapters on HF transceivers, VHF/UHF transceivers, power amplifiers, accessories such as antenna tuners and terminal units, a series of technical articles on the various parameters you should measure and three pages with a side-by-side comparison of *all* the rigs on review.

The majority of reviews are taken from the 1981-1991 period and concentrate on those items retaining value 'above $150'. Some of the reviews of well-known gear as far back as 1965 are included, too. The calibre of the reviews is generally excellent. Isn't it interesting, a review by a reviewer on reviews? I am reminded of Alfred E Neumann, on the front cover of MAD magazine a while back, using a soldering iron to solder the wires entering the soldering



iron he was using... *(Lots of people do that, Neil. It's just that they don't really mean to! Ed.)*

QST employs a very wide variety of people actually performing the reviews and this adds an interesting dimension. Some articles have a chatty style, talking subjectively about such matters as on-air sound, appearance and randomly list those features the writer liked. Others concentrate on distortion and noise figures, band-widths and the like. Most reviews contain laboratory analyses with graphs, spectral display photographs and sometimes include technical material of a dressy, busy and wordy nature. That sort

of data has a limited fascination for most. There are not too many paragraphs of dubious merit, however, and I repeat my admiration of the QST review style.

So why would you want to buy this book? I can think of a few reasons. Familiarity of the gear being used by the other person you are yakking to is one possibility. Can you describe the merits of Ten-Tec HF gear, for example? That's a brand of equipment produced in the States but which is not seen very much elsewhere. Potential purchasers of new (yes, a range of the latest 1991 gear such as the FT-1000 is there) and of recent, second-hand gear may want to see what they are getting in to in advance of the big day.

For me, though, the sheer enjoyment of reading about the transition in our hobby from relatively unsophisticated valve gear to the latest multi-computer all-bells-and-whistles rigs, in the one place, is the key to the book. The Drake TR4 cost as much in 1965 (in earning power) as an FT-990 does now, by my reckoning. But look at the difference in what you get! These, and other kinds of comparisons, are available here. Needless to say, the date and time of the reviews are clearly labelled and a marvellous index is included.

The **ARRL Radio Buyer's Sourcebook** picks out what is for me, one of the best parts out of one of the world's best amateur radio magazines and presents them all for you between one pair of covers. This is a book of great interest and is of the usual, extremely high ARRL calibre. Consider this book carefully if you want some *really* absorbing reading.

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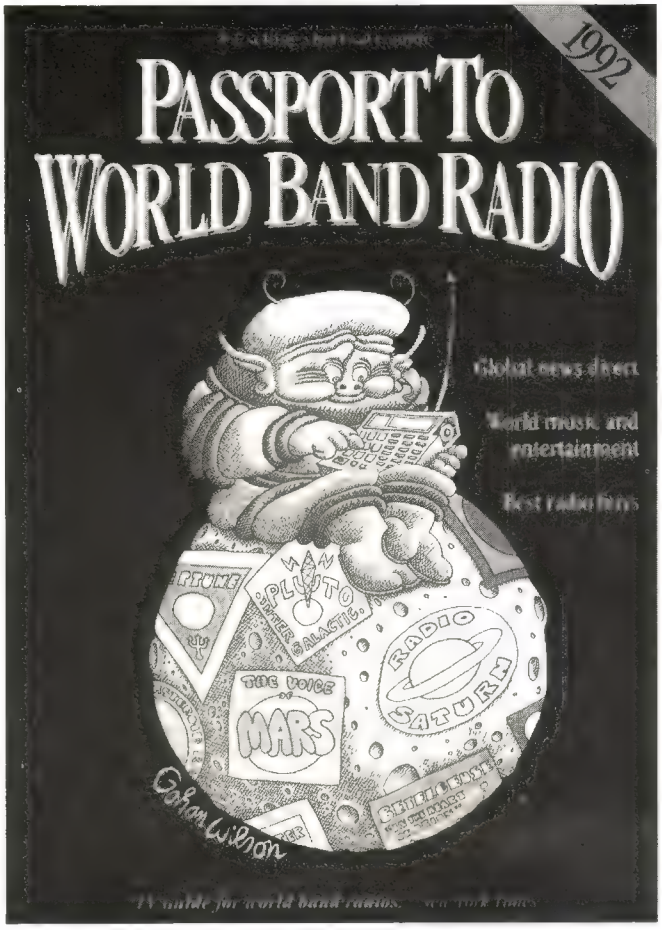

Passport to World Band Radio

1992 Edition. ISBN 0-914941-27-5. Editor in Chief: Larry Magne. 384 pages. Recommended Australian retail price $34. Review copy supplied by Larry Magne.

What Is PTWBR?

It has been a couple of years since I reviewed an earlier edition of Passport to World Band Radio (PTWBR). It is a handy compendium of material that is useful to a shortwave broadcast listener — the 'what, how, when and where' of the pastime. Its format hasn't changed much since last year: the breakdown is about 40 per cent editorial, 40 per cent data and the rest advertising.

Content

The first 50 pages are devoted to introductory articles on radio stations and the art of listening. About 60 pages contain an excellent buyer's guide to shortwave receivers. PTWBR is fair in comments, because you will find praise and criticism. Each mini-review lists the advantages and disadvantages, price, and always a 'Bottom Line'.

The Bottom Line for Sony's US$6500 CRF-V21 portable reads *"...A fax-oriented 'portable' with more goodies than Dolly Parton. On world band, however, the CRF-V21 in most respects doesn't equal some tabletops costing a fifth as much, and only modestly exceeds the performance of some portables that are cheaper yet. According to one Passport reader, Sony's customer technical support for this model is abysmal..."*

These are the kind of comments you *want* to read — not the wishy-washy ones written with advertisers' feelings in mind. The book doesn't seem to have trouble getting advertising either...

New models, current models, and 'golden oldies' are all given their due space. I looked up my favorite (Sony ICF-2001D) and compared the comments made in previous years. I was pleasantly surprised to find that, although the prices hadn't changed, some of the comments had. So it seems that some material is understandably repeated each year, but is also revised where necessary.

Prospective buyers of radios will appreciate the comparative 'star' and 'Editor's Choice' ratings. Where cheap radios are sold under several brand names, they are *all* mentioned — and some brands are cheaper than others. More detailed 'White Papers' are available on some of these receivers from the publisher.

Worldscan

About 50 pages are devoted to station programming information. 'What's On Tonight?' lists evening transmissions in English to the four corners of the world ('Evening' refers to the local time in these zones). 'Worldwide Broadcasts in English' covers exactly that, and lists some of the English-language transmissions from various countries in alphabetic order. 'Voices From Home' covers transmissions in languages other than English, often not intended for international broadcasting, so you might need a better reception setup for them. 'Where in the World II' provides a lot of sensible advice, some good humor, and details of major radio stations.

The Blue Pages

About half the book is devoted to the channel-by-channel guide to the shortwave bands from 2310 kHz to 25970 kHz. It helps you look up a frequency and see what stations use it at a given time. You could use it to identify an unknown station you can hear now, although this is not an easy task where the language is not known to you. Time is always specified as UTC, and 24 vertical columns are criss-crossed with a horizontal bar denoting the operating hours of each station.

The format of the Blue Pages is, from left to right:

- Frequency in kHz
- Country
- Name of station
- New or changed entry
- Location of transmitter
- Earliest time heard
- Season
- Days of operation
- Target zone/s
- Network
- Transmitter power
- Mode
- Alternative frequency
- Latest time heard
- Jamming, if any

So a popular frequency could show up several stations, sometimes at the same time of day. Irregularly-operating stations such as pirates are also listed where known. With the demise of the communist regimes, the amount of jamming is now much reduced.

Reviewer's Bottom Line

This is a reference guide which will primarily be of interest to shortwave listeners. DXers are an implied secondary audience, as many of them are also interested in program content.

PTWBR has now been a steady seller for the past six years or so. Magne and his team have sensibly avoided competing head on with the established **World Radio TV Handbook**, the 'bible' of the DXer which covers every broadcast band from LF to UHF, and includes TV. This keeps everyone happy. PTWBR covers only the shortwave bands; its receiver reviews are noted for their depth, frankness, and technical detail. Its articles are topical and well-written. Last year the lifting of the Iron Curtain was a backdrop to broadcasting changes in eastern Europe. This year the Gulf War provides one of the many color photographs accompanying the articles.

Reference books in this league require updating almost on a monthly basis, so I didn't set out to find errors. I received the 1992 edition in late September 1991, so the data was probably accurate in mid-1991. Readers of **Amateur Radio Action** have an excellent monthly shortwave column to keep them up to date with changes. DXers have their specialist publications and can read the local and international news found on computer bulletin boards.

PTWBR is very easy to read; the reviews will help you select your next receiver; the data will help you find interesting radio stations. It belongs on your bookshelf.

AN

10th Computer Networking Conference — the papers

The ARRL papers from the September 1991 computer networking conference. ISBN 0-87259-359-2. Published by the American Radio Relay League, Newington, Connecticut. USA. Review copy supplied by Stewart Electronics. Recommended Australian retail price $25.

A while back, I remember being confronted by some boring snoozer on the 40 metre band who suggested that all radio amateurs are useless, not much better than those dreaded CBers. His inability to answer a few basic questions of mine made him a little angry and, thankfully, he disappeared mid-QSO. I asked him how he viewed the

radio amateurs who participated in the forefront of several historical developments — SSB, the cubical quad, aspects of satellite communications and new, exciting and very wide areas of packet radio.

Indeed, it is a little daunting to see the richness, technical depth and extreme innovation in that last mentioned area of our hobby at the moment. Where does commercial development take over from the hobbyist in packet radio and other computer-radio interfacing these days, for example? One scan through the book on review will strengthen that question.

The tenth ARRL Amateur Radio Computer Networking Conference, held in Sane José, California, in September 1991 must have been a doozie for those NOT initiated in the ways of this aspect of our hobby. How would such a person choose between sessions on Multi-drop KISS operation or the NOS command set reference session I wonder?

Actually, even to the initiated, this conference must have been an eye-opener. There are papers discussing mail transfer, data compression, modems, higher transmission speeds, spectral efficiency, digital signal processing and a new HF system called CLOVER II which won't hit until mid-1992.

The book on review is 164 pages long and is of a thin, A4-sized soft-cover format. I suspect the articles have been printed using a variety of computers and laser printers. The result is a variety of print faces, formats and sizes, but all have a high degree of visual clarity. The papers themselves are definitely for technically-minded, and represent the very latest thinking on a wide variety of topics.

I count 22 articles varying in context from HF to VHF systems, to speech over a digital link, to using a Macintosh on packet radio developments. All the papers present concepts clearly at the forefront of our hobby and all smack of professional, almost engineering standard in their development and presentation. There are graphs, equations, examples, circuits and even a couple of photographs.

If you wish to catch up on one of the directions our hobby is taking and if you want get hold of indisputable weaponry against the fellow I mentioned in my first paragraph, try this collation of papers. I 'dips me lid' to the US and Canadian amateurs developing such an exciting set of new facets to our hobby.

ND

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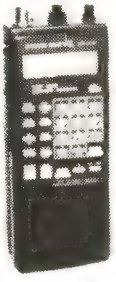

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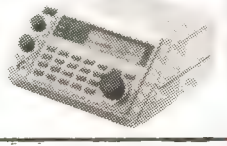

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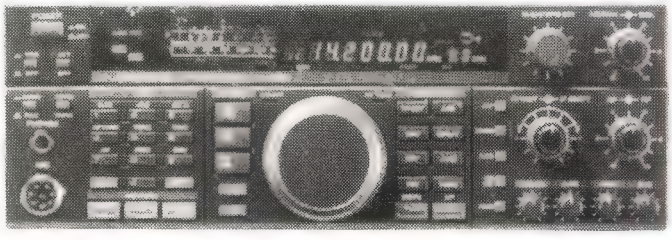

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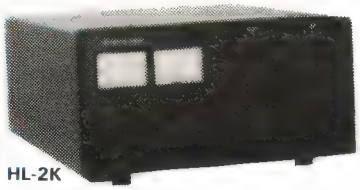

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Georg Simon Ohm

A man of great resistance...

By Greg Baker,
Braidwood, NSW

*March 16, 1992, will mark the 202nd anniversary of the birth of **Georg Simon Ohm**, the man who defined the theories which led to Ohm's Law. Greg Baker tells the story of the man and his struggle to have his ideas accepted.*

These days Ohm's Law is easy to understand and is brushed aside, almost as a self-evident truth, in the first half hour of a radio or electronics course.

But, for **Georg Simon Ohm**, the man who discovered the fundamental relationship between voltage (**E**), current (**I**) and resistance (**R**) that **E = I X R**, it was neither self-evident nor a half-hour exercise. And once he had completed his experiments it was a larger problem to convince others and to have his methods accepted. The eldest of seven children, Ohm was born just over 200 years ago on March 16, 1789 at Erlangen, 10 kilometres north of Nuremburg in Bavaria, southern Germany.

Ohm's father was a self-taught master mechanic earning his living as a locksmith. He was an avid reader of philosophy and mathematics and encouraged Georg and his brother Martin in the study of mathematics, physics, chemistry and philosophy.

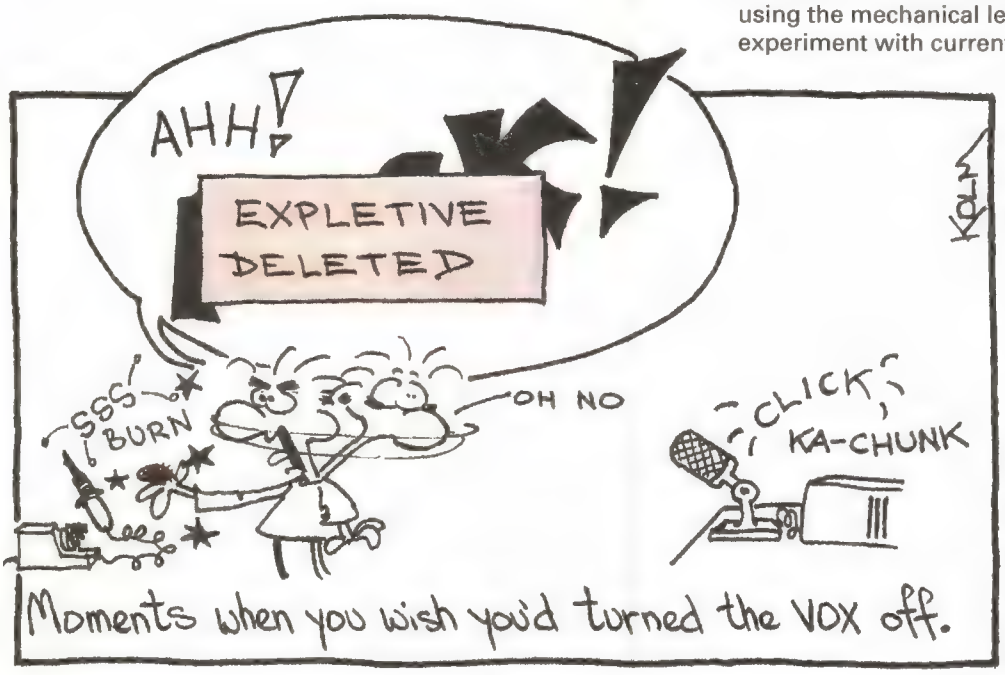
The Ohm brothers showed considerable mathematical aptitude and were likened to the famous **Bernoulli** brothers. In addition, Ohm's father instructed Georg in the techniques of mechanics and tool-making which was to later stand Ohm in good stead.

In 1805 Georg entered the University of Erlangen. After an interruption when he taught mathematics as a private tutor in Switzerland, he settled in Neuchatel in 1809 to continue privately with his university studies. In 1811 he returned to Erlangen and received his Ph D in mathematics the same year.

His heart was set on an academic career but he had to make do with a range of teaching positions until he was made head of the Department of Mathematics and Physics at the Polytechnic Institute in Cologne in 1817.

By the early 1820s he had decided to make a further push for advancement on the academic ladder. To do this he needed to produce some important research work so he turned his hand to physics. This was the age of electrical exploration. Earlier, **Volta** had built his Voltaic pile and, in 1820, the Danish physicist **Oërsted** had shown how a current flowing in a conductor would deflect a compass needle. So Georg turned his mind to electrical phenomena.

His first experiments were on the principle which bears his name: the effect of running a current through different conductors. His approach was experimental. He had read **Fourier**'s discoveries that heat flow between two points in any material depended on the temperature difference between those points and the heat conducting properties of the material. He reasoned that there could be an analogy to current flow. Using a Voltaic pile and wires of different lengths and cross-sections which he had drawn himself using the mechanical lessons from his father, he began to experiment with current flow.



His first published formula connecting resistance, current and voltage was wrong, but he soon realised his error and the problems with the Voltaic pile. The Voltaic pile not only had a high internal resistance, it discharged quickly and the terminal voltage declined during the course of the experiment.

Georg was able to allow for this by bracketing each test wire with two readings of a standard control wire. This produced the correct result but he eventually decided to repeat the experiments with **Seebeck**'s thermocouple. This device makes use of what is now known as the 'Seebeck effect'. This says that if the two ends of a conductor are maintained at different temperatures and these

ends are electrically connected to two conductors of another material, a potential difference will develop between the two ends. This potential difference is not large but is dependent only on the two materials and on the temperature difference.

Using copper and bismuth as the two materials, and with one junction in ice and the other in boiling water, Ohm had a constant potential difference to work with. In modern terms what he had was a simple circuit with his test wires in series with the thermocouple. To measure the current he suspended a magnetic needle adjacent to the test wire and noted the deflections against a circular scale he had graduated himself. Using wires of different lengths as the test resistances **R**, he experimentally derived the formula **I = E/(RI + R)**, where **RI** is the cell internal resistance or, in Ohm's terms, **X = a/(b+x)** where "X is the intensity of the magnetic effect of the conductor whose length is x; a and b represent constant quantities depending upon the exciting force, and the resistance to conductivity of the other parts of the circuit."

In 1826 he published this experimentally-derived relationship in the widely-circulated journal of the physicist Schweigger: *Journal for Chemistry and Physics.*

This was interesting for two reasons. The first is that it is what philosophers of science would call an inductively-derived law. Inductionists argue that laws of science can be derived from a wide observation of natural phenomena. Ohm did this, finding a perfect agreement between his formula and experiments with the variables extended in all directions.

Secondly, because Georg was trained by his father in philosophy and took a keen interest in philosophy, he would have been aware of the philosophical objections to inductivist science. Among other things these objections include the fact that inductivists can never be sure, without prior theoretical guidance, that their experiments are sufficiently wide to cover all possible cases. Simple enumeration of experimental results need not necessarily give a universally-applicable law. Philosopher **David Hume** (1711-1776), for example, had shown that induction by simple enumeration is not a valid form of argument. Ohm would have been aware of this, even if the then influential German philosophers Kant and Hegel did not agree with Hume's reasoning.

In order to correct this problem and to follow up parallels between current flow and heat flow, he set about putting his discovery on a more sound footing. To do this he developed a mathematical theory of current flow in a conductor based on three fundamental laws. Unfortunately, he did not make clear in this theory its basis in his earlier experimental work.

In 1827 he published this in his best-known work *The Galvanic Circuit Investigated Mathematically.*

This was used then, and for well over 100 years after, as a document showing that Ohm had derived and proven his law from theoretical assumptions and not from experiment.

This was clearly untrue, and Ohm was up against other problems too. While his journal papers were widely read and followed up by the younger scientists within Germany, it was a time in that country when the philosophy of Hegel and Kant and the non-mathematical approach to science still held sway amongst those in established positions. And it was those in established positions who effectively controlled academic postings.

Another problem Ohm was up against was the conceptual one which his work precipitated. Until then, while it was known separately that cell terminal voltages differed depending on the cell and that there was current flow in conductors connected to those cells, no-one had ever connected the two and showed they were inter-related. Ohm's Law, of course, does this, but that was a giant conceptual step needed for scientists of the day. This for some was difficult and added to his problems in having his work accepted.

His work did not lead to the academic advancement that Georg had hoped for. Indeed he received so much criticism that he was forced to resign his position. For six years he lived in poverty until 1833 when he received an appointment at the Polytechnic School in Nuremburg. In 1835 he assumed in addition the chair of mathematics at the University of Erlangen.

His work was not widely known outside Germany until 1841 when he was granted the Copley medal by the Royal Society in London. In 1842 he was made a member of the Royal Society.

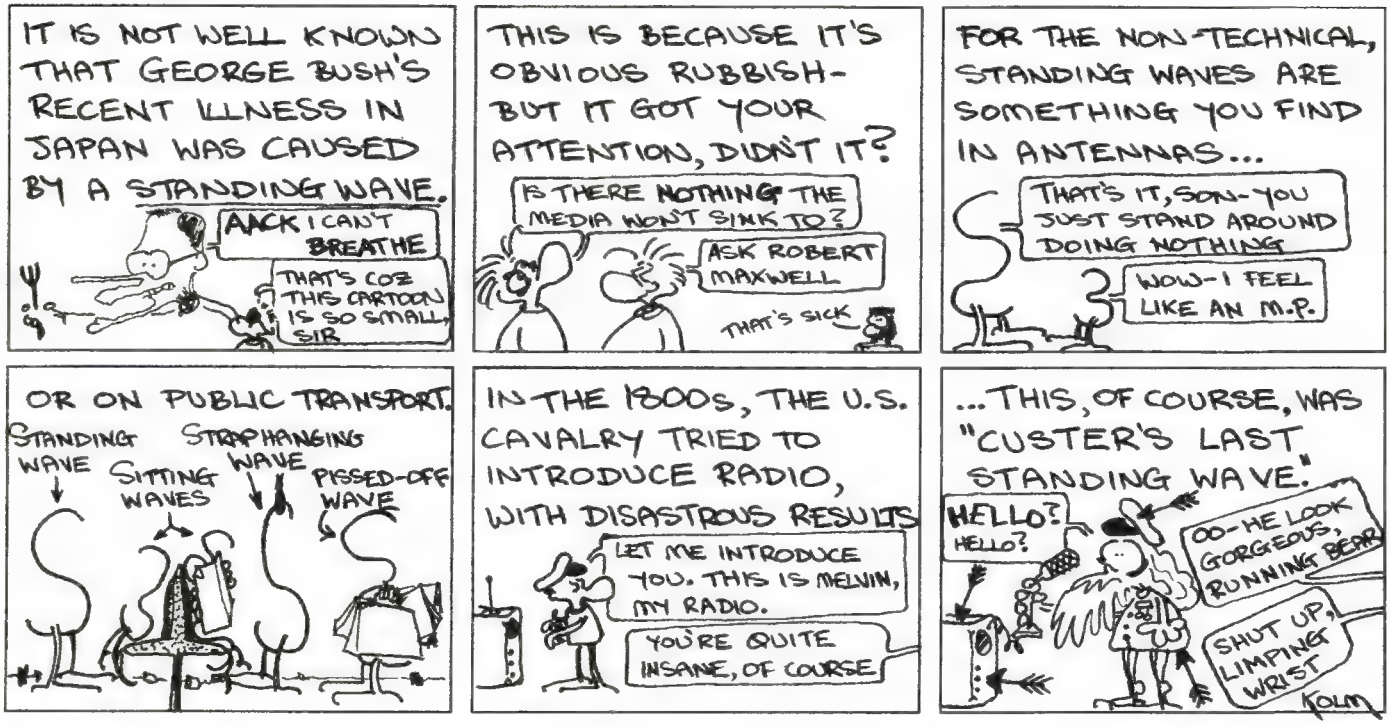
From then on Ohm's fortunes began to improve, but he was growing old and unwell and his sense of duty meant he tired himself fulfilling his teaching obligations and producing a physics text book.

He was appointed full professor of physics at the University of Munich in 1849 but by 1854 he was dead.

His work was finally recognised by the 1881 naming by the Paris International Electrical Congress of the unit of resistance as the **ohm** (Ω) and this is still used today as the SI unit of resistance.

Next time you calculate a resistance, current flow or voltage using Ohm's Law, spare a thought for the man who gave it to us. It was a struggle, but he got there...

HEROES OF HAM RADIO #67. STANDING WAVES



Coming up in

amateur radio action

Icom versus Kenwood versus Yaesu

THREE-WAY HF REVIEW

Which radio is best in the **base rigs** market? We pitch **Icom**'s established **IC-751A** against the new kids on the block—**Kenwood**'s **TS-850S** and **Yaesu**'s **FT-990**.

So who wins? Keep watching...

YAESU FT-990 HF ALL-MODE TRANSCEIVER

Take a look at the all-new Yaesu FT-990 and you'll soon see the similarity to the top-of-the-line FT-1000... and for good reason. The incredible FT-990 embodies many of the advanced features and ease of operation of the FT-1000. But in a more compact, economical package that sports several new advances in both transmitter and receiver design.

Cat D-3260 **$3295**

Designed For Easy Operation

Just like the FT-1000, Yaesu have designed the FT-990 to be as easy as possible to operate. The front panel layout puts all frequently used controls right where they should be..... at your fingertips. All controls are clearly labelled and the digital display provides an abundance of information in an uncluttered and easy to read format. The front panel keypad offers one-touch band selection (160m - 10m) with 2 independent VFOs per band and 90 memories that store the operating data held in both VFOs. You can't help but appreciate the large back-lit analogue meter rather than those confusing bar-graph meters found on other transceivers.

Direct Digital Synthesis (DDS)

Two 10-bit DDS and a magnetic rotary encoder provide silky-smooth VFO tuning, pure local oscillator signals, and very fast Tx/Rx change-over... and that's very important for QSK CW and digital modes. The DDS is teamed with an extremely low-noise, high performance receiver front-end using a PIN-diode controlled push-pull RF amplifier followed by a quad-FET ring mixer. The result is a very wide receiver dynamic range from 100kHz to 30MHz. Transmitter signal purity is also enhanced, with circuit noise nearly 90dB down from the carrier.

Unique Features

- Customizable RF Speech Processor - Yaesu's unique Frequency Shifted Processor (FSP) lets you shift the IF passband of your transmitted SSB signal to provide maximum punch with your voice/microphone combination.
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- A highly efficient AC switch-mode power supply is built-in! It allows high duty-cycle transmission while keeping the weight way down, saving space and the added expense of external power supplies.
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Where — Showground Road, Gosford
When — Sunday 23rd of February
Time — Gates open 8am

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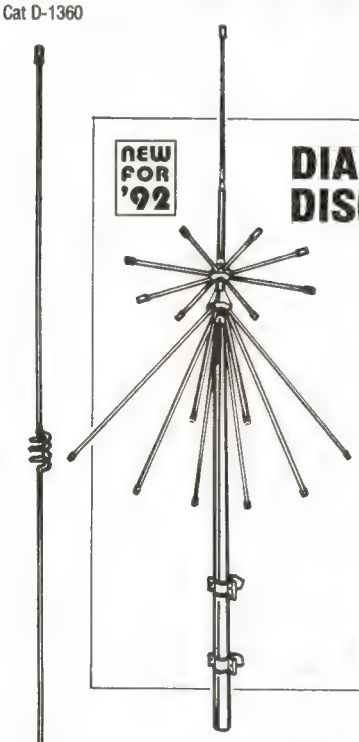
Requires 13.8V DC @ 200mA power supply.

Cat D-1360

$199



NEW FOR '92

DIAMOND D-130J DISCONE ANTENNA

This quality Japanese discone antenna covers the frequency range 25-1300MHz, and was designed to be easy to assemble and install. The extensive use of stainless steel in the D-130J makes it very durable, while allowing transmission on the 6m, 2m, 70cm, and 23cm bands with a maximum power rating of 200W PEP. Comes complete with mast mouning hardware and instructions.

Cat D-4840

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$169

ST-7500 2m/70cm MOBILE ANTENNA

NEW FOR '92

At last, a high performance dualband mobile antenna at a down to earth price. The ST-7500 is just 1metre long and uses a ground independant design to provide high gain (3dB on 2m, 5.5dB on 70cm) with a maximum power rating of 150W. Quality Japanese construction together with a tiltable whip structure make this an ideal antenna for the discerning mobile operator. Requires SO-239 antenna base (D-4035 recommended).

Cat D-4810

$79.95

DIAMOND VHF/UHF BASE STATION ANTENNAS

These high quality, vertically polarised base station antennas are ideal for the discerning Amateur operating on the 2m, 70cm or 23cm bands. They're beautifully constructed Diamond brand antennas from Japan which provide high gain for maximum range. Constructed from robust F.R.P. tubing for excellent all-weather operation, with ground-plane radials for a clean radiation pattern.

2m ANTENNA F23A

DIAMOND ANTENNA

Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x 5/8λ co-linear

Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x 5/8λ(2m), 4 x 5/8λ(70cm)

Cat D-4860

$199

2m/70cm ANTENNA X-500A

Frequency: 144-148MHz, 432-450MHz
Gain: 8.3dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 5.2m
Type: 3 x 5/8 λ(2m), 8 x 5/8 λ(70cm)
Connector: N-type socket

Cat D-4865

$279

23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x 1/2λ co-linear
Connector: N-type socket

Cat D-4870

$239

Limited Stocks!

2m ½ WAVE BASE STATION ANTENNA

MOBILE ONE

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.

Cat D-4820

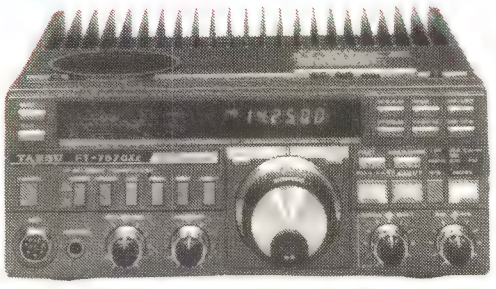
$49.95

DICK SMITH ELECTRONICS

B1283/PB

YOU'LL APPRECIATE THE QUALITY... YOU'LL LOVE THE PRICE!

YAESU



FT-747GX BUDGET H.F. TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and optional FM transceiver providing 100 watts of PEP output on all 1.8-30MHz amateur bands, and general coverage reception from 100kHz to 30MHz. Convenient features include a front panel mounted speaker and easy to read digital display, dual operator selectable tuning steps for each mode, dual VFO's for split frequency operation and 20 memory channels (eighteen of which can store spilt Tx/Rx frequencies). Wideband 6kHz AM, and narrow 500Hz CW IF filters are also fitted as a standard feature. Includes Yaesu MH-1 hand microphone. See ARA Review — Vol 11, Issue 11.

Cat D-2930

2 YEAR WARRANTY!

$1199

Our Most Rugged HF Mobile Transceiver!

ALL MODE HF TRANSCEIVER FT-757GX II

Ready for action! Whether in a demanding H.F. mobile situation, or at home in the shack, the FT-757GX II won't let you down. Based on its popular predecessor, it features the heavy duty die-cast heatsink and rugged metal chassis of the earlier 757GX, but has been upgraded to offer a number of new features. These include...

- All mode operation — SSB, CW, AM, FM(160m-10m)
- 100 watt output on SSB, CW, FM (25W AM) at 100% duty cycle
- High performance general coverage receiver — 150kHz to 30MHz
- Dual VFO's with single button VFO/memory swap functions
- Memories store freq. and mode, plus provide band scanning.
- Inbuilt 600Hz CW IF filter, IF shift and IF notch filters, variable noise blanker, Speech Processor, iambic CW keyer, and SWR meter.
- Includes MH-1 hand microphone.

Cat D-3492

2 YEAR WARRANTY! *SAVE $100* **$1695**

FT-212RH MOBILE 2m FM TRANSCEIVER

2 YEAR WARRANTY!

With 45 watts output over the 144-148MHz range, a rugged diecast chassis for superb RF isolation, extensive use of surface mount components, and a large back-lit LCD with bargraph PO/S-meter. The FT-212RH is an ideal mobile FM transceiver that also doubles as an easy to use base station. Features include 5 selectable tuning steps, a total of 21 memories (18 general purpose, one CALL-channel, and 2 sub-band limit memories for band scanning), inbuilt C.T.C.S.S. encode, as well as a variety of scanning functions. The FT-212RH comes with a mobile mounting bracket, convenient MH-14A8 microphone, and DC power lead.

Cat D-3494

SUPER VALUE **$499**

YAESU

FT-4700RH 2m/70cm MOBILE FM TRANSCEIVER

2 YEAR WARRANTY!

Features 50 watts output on 2m, and 40 watts output on 70cm (430-450MHz), with Full-duplex crossband operation or dual-band reception modes, you can listen for calls on both bands simultaneously, or work someone on one band while listening on the other. The optional YSK-4700 extension cable allows the main body of the transciever to be installed remotely, while the front panel mounts conveniently on the dashboard. The amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls are back-lit for clear readability, with a dimmer switch for nightime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands.

Cat D-3300

$899

Cat D-3301 YSK-4700 extension cable $49.95!

NSW • Albury **21 8399** • Bankstown Square **707 4888** • Blacktown **671 7722** • Brookvale **905 0441** • Bondi **387 1444** • Campbelltown **27 2199** • Chatswood Chase **411 1955** • Chullora **642 8922** • Gore Hill **439 5311** • Gosford **25 0235** • Hornsby **477 6633** • Hurstville **580 8622** • Kotara **56 2092** • Liverpool **600 9888** • Maitland **33 7866** • Miranda **525 2722** • Newcastle **61 1896** • North Ryde **878 3855** • Orange **618 400** • Parramatta **689 2188** • Penrith **32 3400** • Railway Square **211 3777** • Sydney City **267 9111** • Tamworth **66 1711** • Wollongong **28 3800** **ACT** • Belconnen **(06) 253 1785** • Fyshwick **80 4944** **VIC** • Ballarat **31 5433** • Bendigo **43 0388** • Box Hill **890 0699** • Coburg **383 4455** • Dandenong **794 9377** • East Brighton **592 2366** • Essendon **379 7444** • Footscray **689 2055** • Frankston **783 9144** • Geelong **232 711** • Melbourne City 399 Elizabeth St **326 6088** & 246 Bourke St **639 0396** • Richmond **428 1614** • Ringwood **879 5338** • Springvale **547 0522** **QLD** • Brisbane City **229 9377** •Buranda **391 6233** • Cairns **311 515** • Chermside **359 6255** • Redbank **288 5599** • Rockhampton **27 9644** • Southport **32 9033** • Toowoomba **38 4300** • Townsville **72 5722** • Underwood **341 0644** • **SA** • Adelaide City **223 4122** • Beverley **347 1900** • Elizabeth **255 6099** • Enfield **260 6088** • St. Marys **277 8977** **WA** • Cannington **451 8866** • Fremantle **335 9733** • Perth City **481 3261** • Midland **250 1460** • Northbridge **328 6944** **TAS** • Hobart **31 0800** **NT** • Stuart Park **81 1977**

STORES ACROSS AUSTRALIA

DICK SMITH ELECTRONICS

YAESU STOCKS NOT HELD AT ALL STORES. PLEASE CONTACT YOUR LOCAL STORE FOR STOCK AVAILABILITY, OR ORDER BY PHONE 008 22 6610 B1283/PB

Compiled by Kirsti Jenkins-Smith, VK9NL
PO Box 90, Norfolk Island, South Pacific 2899

Your stars for 1992 from Y-ella the Gipsy...

Capricorn (22 Dec. - 20 Jan) The Capricornian can look forward to a year of convenient conditions for getting on with odd jobs around the place. An opportunity to work a 'new one' is frustrated. But the springy nature of the Capricornian soon establishes itself. The Capricornian OM starts checking into nets. The YL can expect to hear a deep sexy voice asking her to QSY. This could result in a request for a QSL card for 10 metres SSB.

Aquarius (21 Jan - 19 Feb) A New Year's resolution takes the Aquarian on the path out of the rut and on to an expanding lifestyle with many new additions to the shack. There could be some rumblings on the domestic scene for reasons not clearly understood by the Aquarian. OMs should take care with their digestive systems. The unattached Aquarian YL will be approached by would-be guest operators. She learns to find her way in the kitchen.

Pisces (20 Feb - 20 Mar.) Some Pisceans will travel abroad this year. There will be many reunions with old friends. Try not to show too much surprise when matching familiar voices to unfamiliar faces. It works both ways. A new project gets under way in the second half of the year, aimed at self improvement. The OM Pisceans benefits by increased QSO rate. The YL discovers new talents and perfects the art of rag-chewing.

Aries (21 Mar - 20 Apr) The gentle nature of the Aries has a calming influence on airwaves troubled by rumours and bickering. Mischief-makers will be seen to fall to the charm of the Aries. An OM Aries could be the winner of a big contest towards the end of the year. The YL gains a reputation for being 'fast', attracting interested probes from the laity.

Taurus (21 Apr - 21 May) Where angels fear to tread, the Tauran goes stomping in. This proves to be a good thing as several issues are brought out into the open. The Tauran may suffer some indignities but a robust nature will assert itself. When the dust settles the OM Tauran puts his plan for new trends into action. Ruled by the planet Venus, the YL starts talking about somebody's 'lovely fist'. Her uninitiated friends think she has gone mad.

Gemini (21 May - 21 Jun) Geminis enter the new year under blue skies. An untroubled mind ensures long sessions in the shack. An important event takes place in March, which brings the Gemini to realise a long-cherished dream. The euphoria lasts until November when 2000 Russian listener cards arrive from the bureau. The OM Gemini could develop a blistered tongue by the end of the year. A mild attack of writer's cramp is indicated for the YL.

Cancer (22 Jun - 22 Jul) An attempt to sidestep unwelcome overtures brings the Cancerian onto unfamiliar net frequencies. The first six months of the year are therefore tinged with the flush of uncertainty. In time the Cancerian will discover new goals to pursue. The OM finds a soulmate to sked on 20 metres. The YL Cancer is snagged on 14,276 kHz where she is thoroughly bamboozled until her sanity is saved by strong and deliberate QRM.

Leo (23 Jul-23 Aug) Stalking through the bands the Leo can seldom resist a temptation to set the world at rights. This could lead to some strange encounters in the new year, adding excitement to an otherwise dull start. There are pleasant surprises in store for the Leo around August, thanks to a well-heeled benefactor. The OM Leo will be breaking new ground. The YL finds a new meaning to the term 'short path'.

Virgo (24 Aug - 23 Sept) The Virgo, under strong influence of the planet Mercury, follows an intuition to discover a new DXCC country. The DXpedition leads the Virgo into the wilderness, either physically or metaphorically, depending on circumstances. The OM Virgo emerges from this experience with a yen to take up ten-pin bowling. The YL takes up craft. It could turn out to be a patchwork quilt made out of invalid IRCs.

Libra (24 Sept - 23 Oct) A matter close to the heart of the Libran comes to fruition early in the year. This sets off a chain reaction of hitherto closed doors opening to reveal what has been going on behind the scenes over the past couple of years. The OM Libran sets a certain plan in action in July or August. The YL should forget about that planned eyeball with the Sun. It is most unwise.

Scorpio (24 Oct - 22 Nov) The year is off to a bright start for the Scorpio. An old friend appears on the bands after several years absence. June to September is temporarily darkened by what appears to be a hole in the ionosphere, caused by over-bombardment. The OM Scorpio takes this opportunity to study ground waves. The YL becomes involved in a planned YL DXpedition to Mount Athos.

Sagittarius (23 Nov - 21 Dec) The Sagittarius can look 1992 in the eye with confidence. The only cloud on the horizon is a minor squabble with a neighbor who is ignorant of the finer points of antenna technology. This will be solved amicably when the neighbour moves to China. The OM Sagittarian benefits in many ways when trying to obtain YL DXCC Honor Roll, but should look before he leaps. The YL is invited to donate money to the 'Misunderstood Pirates Society'.

From our distressed correspondents:

Dear Y-ella, I called ZA1A for 20 days without a reply. My family has moved out and the dog is dead. Where did I go wrong? Peter (born 15/7/39)

***Dear Peter**, As a Cancer you tend to lack a proper sense for detail. It appears that you got tangled up in your VFOs and actually did all your calling on 15 metres while trying to work the ZA on 20 metres. Failing to notice when your family moved out, you neglected to feed the dog which consequently starved to death. Y-ella.*

Dear Y-ella, I enjoy amateur radio and always invite everyone I talk with to come and stay as long as they like. The other day 24 of them arrived on my doorstep with their families, dogs, cats and poultry. What should I do?

Tilly, (born 13/4/48)

***Dear Tilly**, As a kind-hearted Aries and in the spirit of amateur radio, there is not much you can do. However, strictly between you and me; if you were to drive your car full pelt through the plate glass windows of Myers, you stand a chance of getting arrested and locked up for the duration. It is worth a try. Y-ella.*

Editor's note: you can write to Y-ella care of Kirsti at the above address.

PACKET RACKET

By John Day, VK3ZJF@VK3BLW
PO Box 281, Oakleigh, Victoria 3168

Every now and again I start getting bored with just playing(?) packet radio and I look for a bit of a change. Sometimes I look for something useful that packet might be able to do for us as amateurs. Yes I know, we can do more of the community service things we have always done, we can do them more efficiently and we can do them without having to pass the traffic ourselves. But in reality much of that is only more of the same but done differently. So this month we are going to talk about something I have had a great deal of fun playing with in the last few months — remote weather sensing. Well, in my case it's not *really* remote, just from one side of the house to the other, but the equipment I was using has many potential applications for amateurs and for their public service groups.

The **Kantronics WeatherNode** is a telemetry, or data-collecting, unit which is intended to be used with computers, phone line modems or packet radio systems for collecting weather information. It uses a series of low-cost sensors for measuring wind speed and direction, temperature and rainfall. Electronically, the WeatherNode is actually a rather clever piece of marketing. Kantronics has a general-purpose telemetry unit, known as the KTU. This unit combines 32 bytes of RAM, 32k bytes of EPROM, and a 63B03 microprocessor with a flexible multi-channel analogue and digital input section. This section can support multiple analogue inputs, digital inputs, digital outputs and such things as counter inputs and pulse train or square wave output. Now imagine what you would think if somebody advertised such a unit in the pages of **Amateur Radio Action**? Yes, it *would* seem a bit pointless, wouldn't it, nobody would know what to *do* with it!

So the bright sparks at Kantronics (I know you will read this Phil, that expression is a compliment out here!) got together and came up with the idea of building the KTU into a low cost weather station which could be accessed by packet radio systems. Duly a source of quality, but reasonably-priced, sensors was secured and by the end of 1990 the WeatherNode was born. *(In case you're wondering about John's comment addressed to 'Phil', he's referring to the company founder and president,* ***Phil Anderson, WØXI****, who reads this magazine. Ed.)*

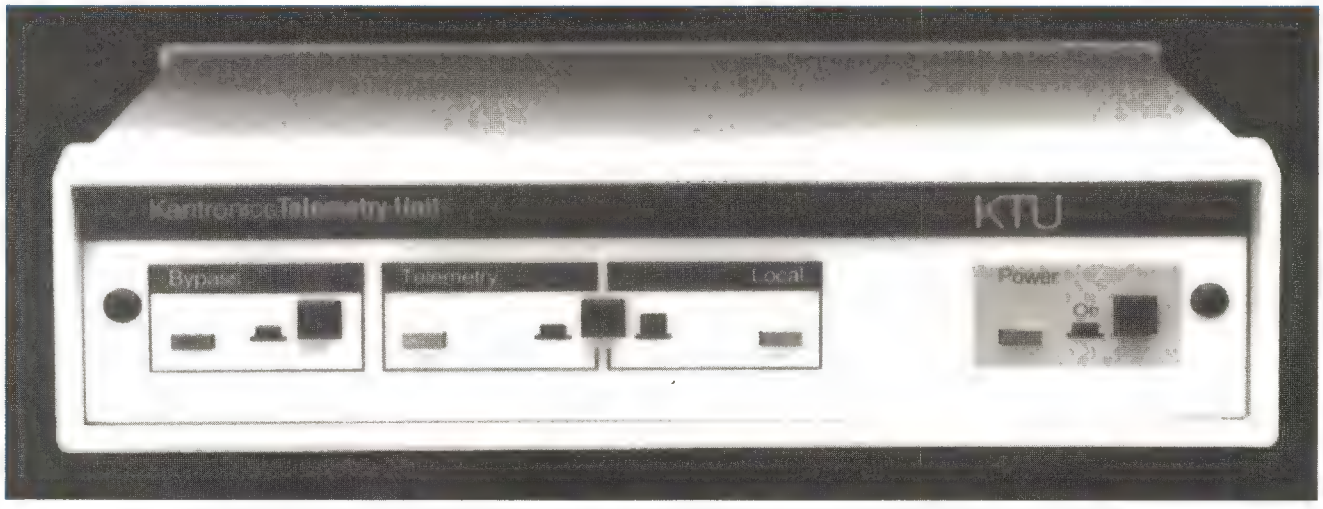
Physically, the WeatherNode looks like any other Kantronics product, housed in its distinctive fawn-colored aluminium housing with plastic moulded end-panels, switches and indicators on the front panel and connectors on the rear. A WeatherNode can be connected directly to a computer and interrogated or programmed simply with the use of a terminal program. It can also be configured for use with a phone line modem, but of most interest to me was the potential to locate the unit remotely and see what was happening where I wasn't.

The setup

With the parts of the system assembled according to the manual I next had to connect the WeatherNode to the RS232 connector on the packet TNC I was using. In this case I used a Kantronics KPC-2. Having configured the TNC according to the manual I was then able to connect to the TNC — and I would be connected to the WeatherNode which was on the other side at the same time. Pretty simple really; all I used in addition was a simple 12V 8A power supply I routinely use for demonstrations, an Icom IC-2GA radio I keep handy and I was on the air. This gear was set up on the other side of the house which is about 20 metres away.

Back in the shack everything worked out all right — I could connect and get the responses.

(Bit of an overkill, though, isn't it John? 500 watts ERP to get the the other side of the house?!! Hope the QSB wasn't too bad over the DX path! Hi. Ed.)



The Kantronics Telemetry unit

Commands

Like everything with a micro in it the WeatherNode has its own command language! Here is a summary:

B(ye)	Disconnect from the WeatherNode
H or **?**	Display a help table of user commands
D(ata)	Receive data from the WeatherNode
DM(etric)	Receive data in metric units
DU(SA)	Receive data in imperial (US) units
HELP	Display a list of all commands
HELP D	Provides a full description of the DATA command
PR(ogram)	Display or change the sampling program in the WeatherNode

User's Computer Screen Display

```
***CONNECTED TO WDØEMR
wxn:DATA T 3
3/16/90  11:37:18 TF = 0064.2 DEGF
3/16/90  11:37:08 TF = 0064.2 DEGF
3/16/90  11:36:58 TF = 0064.0 DEGF
wxn:DATA WD 3 3
3/16/90  11:38:11 WD = 00215 DEGN
3/16/90  11:38:08 WD = 00215 DEGN
3/16/90  11:38:05 WD = 00220 DEGN
wxn:DATA WS 2 3
3/16/90  11:38:36 WS = 00023MPH
3/16/90  11:38:33 WS = 00023MPH
wxn:DATA V9 2
3/16/90  11:37:58 V  = 3.750 V
3/16/90  11:36:58 V  = 3.650 V
```

The **DATA**, **DU** and **DM** commands are used to display the data held in the WeatherNode. DATA provides the information in the default units as set up by the sysop. The format of the DATA command is:

DATA [[sensor] [n[step]] START ddhhmm]]

where:

sensor is one of the standard sensors, if it is not specified all sensors will be displayed;

n is the number of samples you wish to display, the default is one sample;

step is the increment between samples. The default is one. Step 2, for instance, would display every second sample; and

START is a keyword that allows you to specify the earliest sample you wish to see. The start time is specified in days, hours and minutes.

The standard sensor names for the WeatherNode are:

TP	Internal unit temperature
TF	Outside temperature
WS	Wind speed
WD	Wind direction
RG	Rain gauge

When combined into a **DATA** command they might be used like this:

DATA 5

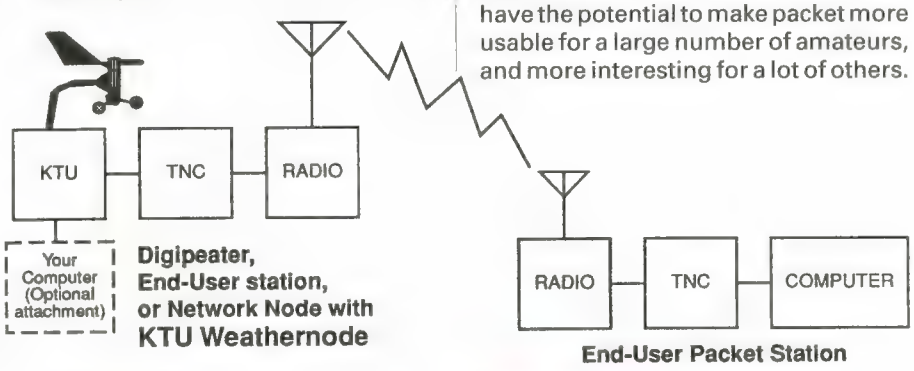
would give the last five readings for each sensor.

DATA 5 2

would give 5 readings displayed but only every second sample would be seen.

DATA TF WS 3

would result in the display of one reading of the external temperature and three samples of wind speed.



Digipeater, End-User station, or Network Node with KTU Weathernode

End-User Packet Station

DATA 5 START 011830

would give us 5 readings for all sensors starting as close as possible to 6:30pm on the first of the month.

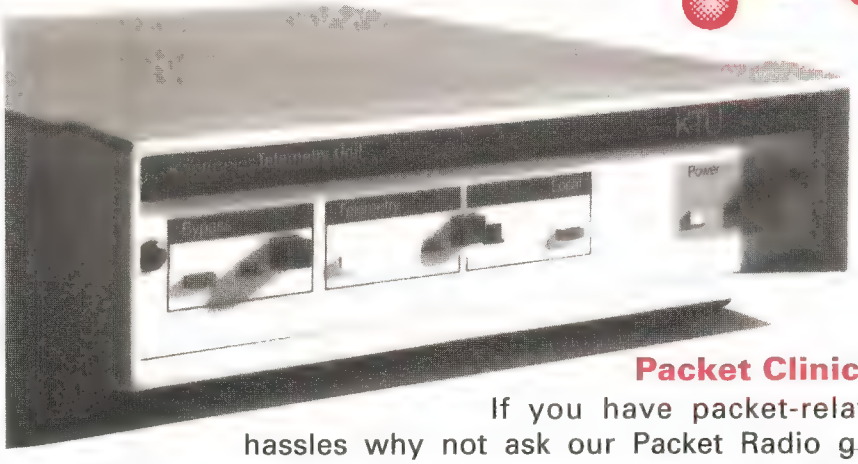
In order to find out how the sensors are being sampled you can look at the current program for the readings. If you give the PR command you might get a display like this:

R8H RG R10M TP TF A5M WS WD

...which, once translated, reads **R**ecord every **8** **H**ours the **R**ain **G**auge, **R**ecord every **10** **M**inutes the internal temperature (**TP**) and the external temperature (**TF**), and **A**verage every **5** **M**inutes the **W**ind **S**peed and **W**ind **D**irection.

Naturally, when you are finished you can use the **B**(ye) command to disconnect from the WeatherNode unit. This way you can use a NET/ROM or similar TNC and have the user **STAY** connected to the node.

Quite honestly I had a lot of fun with the WeatherNode. This, and some other aspects of packet radio such as the DX Cluster we discussed some time back, have the potential to make packet more usable for a large number of amateurs, and more interesting for a lot of others.



Packet Clinic

If you have packet-related hassles why not ask our Packet Radio guru himself? Direct your query to **Packet Racket**, ARA, GPO Box 628E, Melbourne 3001, and we'll see if we can help.

Six metre information panel

Asian Activity

Watch out for these callsigns on six metres from Asia:

BY4AA, BY4RB, BT4AG, BZ4SAA, BZ4SAB from China; BV2VA, BV2BO, BV2DP, BV2DQ, BV2AP from Taiwan; HL9TG, HL5BVW, HL2IPC, HL2AKL, HL1EIZ, HL5BMA, HL5BVW, HL1JV, HL1ST from Korea; VS6BG, VS6BI, VS6XMQ et al from Hong Kong; and 4F3BAA, KG6UH/DU1 and N7ET/DU7 from the Phillippines.

Indicators

50 MHz beacons continue to be heard around the globe as indicated below.

50.0100	JA2IGY
50.0130	4N3SIX JN76hd Slovenia.
50.0160	JA6YBR
50.0215	FR5SIX Reunion Island.
50.0270	JA7ZMA
50.0430	ZL3MHF
50.0460	VK8RAS. On test.
50.0480	JA7YYL
50.0520	ZL3MHB On test.
50.0535	VK3SIX. 100w to ground plane, (0100 to 0700z daily; nine elements beaming NE.)
50.0550	JA5FFJ
50.0570	VK7RST. Presently QRT due to interference from VK8VF.
50.0572	VK8VF. Runs 1.2 kHz above assigned frequency of 50.056 MHz.
50.0610	KH6HME
50.0745	VS6SIX Hong Kong.
50.0770	VK4BRG Sarina 3w to dipole, solar powered.
50.084	3D2FJ.
50.3150	FX4SIX. JN06CQ running 50 watts erp.
50.4905	JG1ZGW
52.3200	VK6RTT
52.3470	VK4ABP
52.4420	VK4RTL
52.4450	VK4RIK

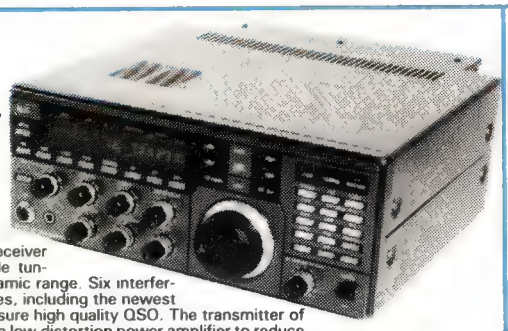
QSL Routes

3D2PO	SASE to VK3OT, PO Box 622, Hamilton Vic 3300.
CN2JP, CU3	Steve Lund, 10180 Mill Station Rd, Sebastopol, California 95472.
DC6KI	Wolfgang Roessler, Duerener Strasse 53, D-5376 Engelgau, Germany.
DJ2PL	Hermann Geib, Waldstrasse 12, D-6534 Stromberg, Germany.
DK2PR	Peter Block, Grasdorf 80, D2802 Ottersberg, Germany.
DK6JL	Rudiger Hartwig, Box 1212, 4054 Nettetall, Germany.
DK8OK	Nils Schiffhauer, Willelm-Henze-Weg 12, D-3167 Burgdorf, Germany.
DL8HCZ	Joachim Kraft, Grutzmuhlenweg 23, D-2000 Hamburg, Germany.
DL9AAK	Gerd Ohlendorf, 3361 Badenhausen, Thuringer Str 28, Germany.
FC1BUU	J-Cl Paillaugue, 8 Place des Fauvettes, 33270 Floirac France.
FC1JG	Jacques Guerin, Petit Sonnalier, 13200 Arles, France.
FC1OIH	Vincent Lecler, 18 rue des Marnerons, 28210 Fonville, France.
FD1GTR	Jean Philippe Guillot, Rte de Cheusse, La Gabardeliere, 17139, Dompierrre
FE6HSW	Thomas Pierre-Jean, 20 rue des Saulniers, La Pointe 49000 Angers, France.
IK1EGC	Gattolin Daniele, Vic Olo Brunetta 3, 10040 Druento, Torino, Italy.
IK2GSO	Colombo Enrico, Via Esculapio 9C, 20030 Seveso, Italy.
ON1CDQ/ON4ANT	Geerte Van De Velde, Resedastraat 5, 1770 Liedekerke, BT Belgium.
ON4AMX	Marc Michiels, Kraasbeek 37 B-3211, Tielt-Winge, Belgium.
ON4PS	Pierre Stoffel, 187 rue de Fauconval, 1367 Huppaye, Belgium.
OZ1BVW	Birger Jensen, Ingridsvej, 57, 6000 Kolding, Denmark.
OZ1LO	Leif Ottosen, bankevejen 12, Kong DK-4750, Lundby, Denmark.
SM6CKU	Bengt-Arne Jockert, Allatorp 1446, S-43033, Fjaras, Sweden.
SM6CMU	Ingemar Olsson, Krokv 4, 43492 Kungsbaka, Sweden.
T3ØJH/V63JH	Jack D Haden, PO Box 299, Ryde, NSW 2112. *SASE please.*
YU3ES	Stan Jeric, Vena Pilona 4, 66000 Koper, Slovenia.
YU3IT	Milan Casar, 69206 Krizevci 47, Prekmurje, Slovenia.
YU3ZV	via **OE6LOG**.

JRC

JST-135

HF Transceiver



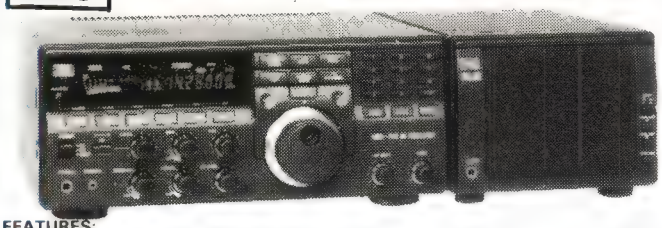
FOR THE CONNOISSEUR

The great coverage receiver front-end offers variable tuning to enhance the dynamic range. Six interference rejection techniques, including the newest "notch follow filter" ensure high quality QSO. The transmitter of heavy duty design uses a low distortion power amplifier to reduce the high-order IMD and a specially-constructed heat sink to enable continuous full-power transmission. The frequency synthesiser employs a one-chip direct synthesiser (DDS) IC, ensuring high C/N and high-speed response. The JST-135 is a sophisticated HF transceiver to meet your requirements for global DX communications.

SPECIAL: JST-135 + PS = $2990

JRC

NRD-535 WORLD'S BEST SW RECEIVER



FEATURES:

- ★ Double front end continuously tuned circuits. Much superior to conventional BPF systems as adopted in all other receivers
- ★ Magnetic rotary encoder for precision 1 Hz tuning
- ★ ECSS circuit board (optional) (exhalted carrier single sideband)
- ★ Continuous band pass control from 2.4 KHz to 500 Hz (optional)
- ★ Pass — band shift (PBS)
- ★ Noise blanker
- ★ All mode reception
- ★ Memory search, scan & sweep reception
- ★ Complete modular design
- ★ All mode squelch
- ★ Notch filter
- ★ Remote computer control
- ★ 200 memory channels

Only $2050

SR STANDARD

C528E

TWIN BAND H/H TRANSCEIVER (Not to be confused with other DUALBANDERS)
Standard have made it again The C528 is the first H H twin bander with completely independent functions
With incredible sensitivity of 016uV for 12dB SINAD it can also be used as a repeater on VHF /UHF band
Also covers cellular phone band 900 975 MHz for RX only
FEATURES AT NO ADDITION COST

- ★ Simultaneous reception of two bands
- ★ Simultaneous TX/RX (FULL DUPLEX)
- ★ Twin Frequency Display
- ★ Twin 5 meter and other functions (squelch, busy scan etc)
- ★ Band not being used may be switched off
- ★ Independent controls (volume), squelch etc)
- ★ Dual monitoring of priority channels on UHF & VHF
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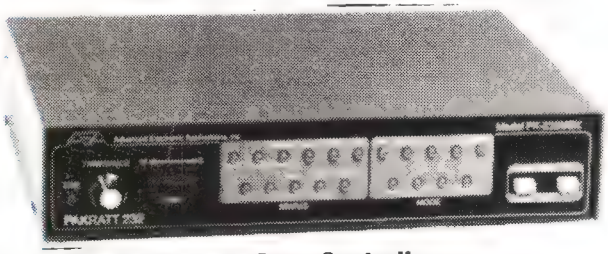

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MAX ELEMENT LENGTH	7.5M
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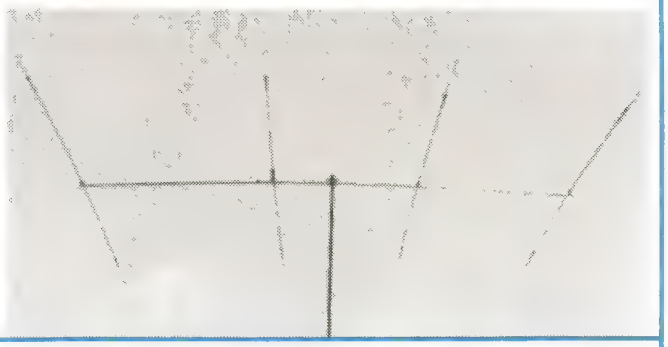

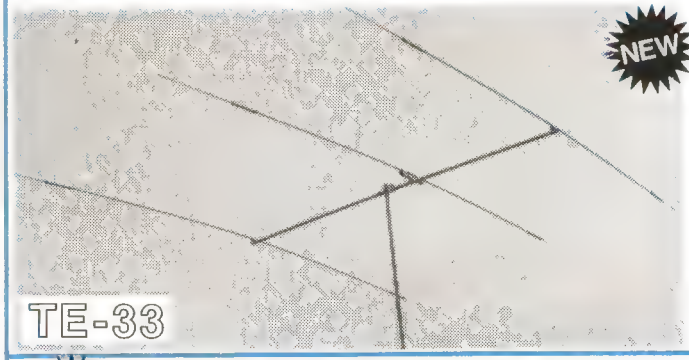

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WIND SURFACE	0.25m	WEIGHT	9.1kg

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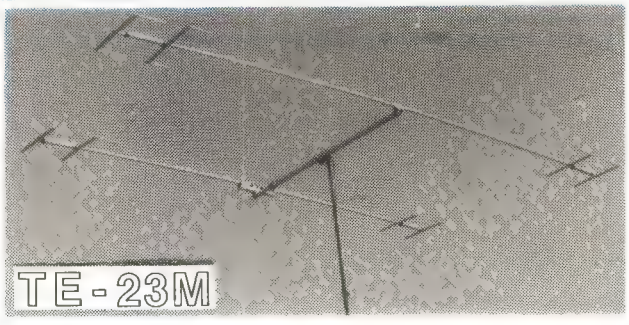

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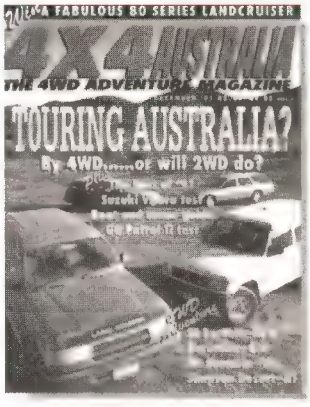

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All times in UTC (Co-ordinated Universal Time, 'z'). Add 10 hours for Eastern Standard Time, 11 hours for Eastern Summer Time, 10.5 hours for Central Summer Time, eight hours for Western Time and 13 hours for NZ Summer Time.

VOA update

Once again we lead off with developments at the **Voice of America** which, as foreshadowed last issue, commenced regular broadcasts from its new Botswana relay base on December 7. Two 100 kW transmitters came on line, serving the African continent from a site near Selebi-Phikwe, where the VOA's medium wave relay has operated for some years.

The shortwave facility has been hurriedly prepared, with "off-the-shelf" transmitters installed, rather than the custom-made units normally utilised by the VOA. A further two transmitters will come on line during the first quarter of this year, but until then the facility is operating to the following schedule:

English is from **0300-0500z** on 7265 kHz and **1600-2200z** on 15,445 kHz; French goes out from **1830-2030z** and **2100-2200z** on 17,870 kHz. On Saturdays and Sundays, the French program continues through the **2030-2100z** period as well. Portuguese is listed from **0430-0500z** on 15,370 kHz, and from **2200-2300z** on 15,370 and 17,870 kHz; Swahili goes out from **1630-1730z** on 17,705 kHz and Hausa from **2030-2100z**, Monday to Friday only on 17,870 kHz.

These frequencies are in addition to those emanating from other VOA transmitters covering the African continent.

This new facility will give QSL hunters an easier crack at verifying Botswana, previously a very difficult proposition due to the reluctance of the government station, **Radio Botswana**, to issue QSL cards on a regular basis to overseas DXers. Those who were lucky enough to catch test transmissions from VOA Botswana on December 6 are eligible for a special verification card, printed for the occasion.

Not widely known is the fact that the Voice of America has been for some months utilising the spare transmitter capacity at **Radio Liberty/Radio Free Europe**'s Gloria site, in Portugal. For the "W91" transmission period, usage is according to this plan:

0000-0100z 9690 and 7125 kHz in Uzbek; **0300-0400z** 6180 and 7190 kHz in Russian; **0300-0500z** 6090 kHz in Ukranian; **1200-1400z** in Russian, **1400-1500z** Uzbek, both on 21,625 kHz; **1600-1800z** on 9530 kHz in Russian and on 11,855 & 15,255 kHz in Ukranian; **1800-1830z** Estonian and **1830-1900z** Lithuanian, both on 9650 kHz; **1800-1900z** on 11,805 kHz, **1800-2100z** on 7270 kHz, **1800-2300z** on 11,825 kHz, **1900-2100z** on 9585 kHz and **1900-2200z** on 9575 kHz, all in Russian.

The latest schedule also shows increased use of **Radio Deutsche Welle**'s Wertachtal site, for VOA services to Europe, the Middle East and North Africa.

5965 kHz: 1700-1730z Albanian, 1730-1800z Bulgarian, 1800-1900z Romanian, 1900-1930z Greek, 1930-2000z Albanian, 2000-2030z Bulgarian, 2030-2130z Serbo-Croatian
5975 kHz: 1900-1930z Greek, 1930-2000z Albanian
5985 kHz: 0400-0415z Latvian, 0415-0430z Lithuanian, 0430-0445z Estonian
6060 kHz: 0500-0700z English, 2200-2400z Russian
6160 kHz: 2000-2100z Turkish
7105 kHz: 0130-0200z Urdu, 0300-0400z Russian, 0400-0415z Latvian, 0415-0430z Lithuanian, 0430-0445z Estonian
7120 kHz: 0300-0400z Russian
7170 kHz: 1800-1830z Estonian, 1830-1900z Lithuanian
7245 kHz: 1530-1600z Latvian
9525 kHz: 2000-2100z Turkish
9530 kHz: 0130-0200z Urdu, 1800-2000z Arabic, 2100-2200z Arabic, 2200-0000z English
11,805 kHz: 1600-1700z Russian, 1700-1730z Albanian, 1730-1800z Bulgarian
11,825 kHz: 0500-0700z English
11,840 kHz: 0730-0800z Arabic
15,225 kHz: 1600-1700z Armenian
15,280 kHz: 1200-1400z Russian
17,895 kHz: 0300-0330z VOA Europe program in English, 0330-0800z Arabic
21,455 kHz: 1330-1500z Arabic
21,535 kHz: 1500-2200z Arabic
21,570 kHz: 0800-1000z VOA Europe in English, 1000-1100z English

Staying with the United States, on December 17, 1991, the special US Presidential task force on international broadcasting tabled its recommendations regarding the future of US government sector stations beaming towards foreign audiences. Established a few months ago, the task force was commissioned to examine three things: whether US international broadcasters should be combined into a single entity, technological developments in the field, and lastly to consider how government broadcasting could co-operate with private enterprise.

At a press conference in Washington DC, committee chairman, journalist John Hughes, advised that most recommendations coming out of the discussions related to the first aspect, and more specifically the possibility of restructuring the **Voice of America** and **Radio Free Europe/Radio Liberty**. Much to the relief of some lobbyists, the prevailing view emerging was that the two organisations should preserve their individual identities, at least for the coming decade. The US government spends close to US$500 million annually on international radio and TV broadcasting, and there had been considerable pressure to rationalise the VOA and RFE/RL, particularly in view of the projected 1992 US budget deficit of $362 billion.

According to Mr Hughes, the two stations are seen to have distinct roles; The Voice of America is regarded as the 'official' US international representative on the bands, concentrating on national and international news, whilst at the same time projecting its country's culture abroad. In contrast, RFE/RL are termed 'surrogate broadcasters' in that their purpose is to engage in the type of broadcasting that their audience in Eastern Europe would have had access to if their countries had democratically-elected governments. RFE/RL is considered to have a continuing role for the next few years as the target region remains in a state of flux and the future of the fledgling democracies is still uncertain.

Nostalgia corner

***Radio Vatan** is now known as Iran's **Flag of Freedom Radio** and opposes the present Iranian government.*

This will verify and acknowledge your reception of "Radio Vatan", (Radio Homeland). We are a group of Free Iranians broadcasting the truth to the people of Iran. Our schedule follows:

15555 Khz 0405-0600 GMT
1705-1800 GMT

9027 Khz 0405-0600 GMT
1605-1800 GMT

The first hour of each broadcast is a program dedicated to keeping the great cultural heritage of Iran alive. The second hour of each program provides news and analysis of current events in Iran. We hope you will tell everyone you know of our humble efforts.

The Free People of Iran

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۱ـ ساعت پخش برنامه: ۴/۰۵ تا ۶/۰۰ بوقت گرینویچ
(۷/۳۵ تا ۹/۳۰ بوقت تهران)
۲ـ ساعت پخش برنامه: ۱۷/۰۵ تا ۱۸ بوقت گرینویچ
(۲۰/۳۵ تا ۲۱/۳۰ بوقت تهران)

۹۰۲۷ کیلوهرتز مطابق با موج کوتاه ۳۱ متر
۱ـ ساعت پخش برنامه: ۴/۰۵ تا ۶/۰۰ بوقت گرینویچ
(۷/۳۵ تا ۹/۳۰ بوقت تهران)
۲ـ ساعت پخش برنامه: ۱۶/۰۵ تا ۱۸ بوقت گرینویچ
(۱۹/۳۵ تا ۲۱/۳۰ بوقت تهران)

ساعت اول هربرنامه به مباحث مربوط به میراث های فرهنگی و ملی اختصاص یافته ودرساعت دوم اخبار وتفسیروقایع جاری ایران را با طلاع شنوندگان عزیز میرسانیم.

خواهشمندیم شنیدن برنامه رادیوطن را به دوستان و آشنایان خود توصیه کنید واین بهترین تشویقی خواهد بود برای کوشش های تا قابل ما ایرانیان آزاده دوراز وطن.

مردم آزاده ایران

ایستراد
پوشش ۱۲ الف
دال ـ ۶۸۰۰ مانهایم یک
آلما

Other committee recommendations concern the strengthening of broadcasting to other areas of the world such as the Middle East, Africa, Latin America and Asia, with special emphasis on China. There are presently two separate pieces of legislation before Congress. One is aimed at the establishment of a station to be known as **Radio Free China** and the other suggests a more broad-brushed approach, **Radio Free Asia**, which would also target Vietnam, Laos, North Korea and possibly Cambodia. To determine the future of surrogate broadcasting to the Asian region, a new commission is to be appointed, three of its number to be chosen by President George Bush.

In the spirit of the present monetary constraints, any project in this direction will be modest at first, perhaps making use of existing VOA facilities or, alternatively, government or private transmitters in other countries. The resultant station will come under the auspices of the **Board of International Broadcasting** (the controller of RFE/RL) which, incidentally, will most likely also take up the cudgel against the Cuban government by taking over the operations of **Radio Marti**, presently administered by the VOA.

Soviet Union

Here are the latest schedules for some of the relayed broadcasts from international stations via transmitters in the Soviet Union:

• **Radio Deutsche Welle** uses relay transmitters with a capacity of between 200 and 1000 kW at Novosibirsk, Zhigulyovsk and Irkutsk according to this plan: 0200-0250z in English, 0300-0350z Pashto, both on 12,055 kHz; 0800-0850z Dari on 17,675 kHz; 1000-1050z Persian on 17,735 kHz; 1000-1400z and 2200-0000z in German on 7340 kHz; 1100-1150z Japanese on 7380 kHz; 1200-1320z Chinese on 7390 kHz; 1400-1800z German and 2230-2320z Indonesian on 7315 kHz; 1430-1515z Urdu, 1515-1600z Hindi and 1600-1650z English, all on 7305 kHz.

• **Radio Beijing** goes out via Soviet transmitters from 1400-1457z in Turkish on 5905 kHz; 1600-1657z Arabic on 12,065 kHz; 1800-1827z Persian on 7130 kHz; 1830-1927z Arabic on 7200 kHz; 1900-1927z Turkish on 11,700 kHz; 2030-2127z French on 9550 kHz; 2200-2257z English on 7170 kHz.

• **Radio Havana** also rents air time, from 1800-1900z Arabic on 9760 kHz; 1800-2000z Spanish, 2000-2100z Portuguese on 11,920, 9590 and 9515 kHz; 1900-2000z French, 2000-2100z English, both on 9760 kHz; 2100-2200z French on 9600 and 7215 kHz; 2200-2300z English on 7215 kHz.

• **Radio Afghanistan**'s external service frequencies via the Soviet Union are said to have been cut back recently, however the latest available schedule shows: 1930-1030z English on 17,720 and 15,140 kHz; 1600-1630z Arabic on 11,715 and 9790 kHz; 1630-1730z Pashto, 1730-1800z German; 1800-1900z English and 1900-1930z French, all on 7215 and 6145 kHz.

• The **Lao National Radio** has a broadcast in French for Europe from 1100-1130z, currently on 15,190 and 11,960 kHz.

Now for some of the home-grown stations:

• **Radio Ekho Moskvy** is on air from 0500-0800z and 1700-2100z (starting at 1600z weekends) in Russian on 6165 and 1206 kHz.

• **Radio Vedo** broadcasts from 1400-1500z Monday to Wednesday, and 1500-1900z Monday to Friday on 13,710, 11,760 and 1161 kHz; 0300-0600z (weekends only) on 7125, 5915 and 1161 kHz.

This news courtesy of Shigenori Aoki of the Nagoya DXers Circle in Japan.

Tune into Germany

Radio Deutsche Welle has an extensive English language service and, fortunately, most transmissions can be well heard in this part of the world.

For East Asia and Australasia:
0900-0950z 6160, 11,915, 17,780, 17,820, 21,465, 21,650 and 21,680 kHz
2100-2150z 6185, 9670, 9765, 11,785 and 15,350 kHz

To South Asia:
0200-0250z 1548, 6035, 7285, 9615, 9690, 11,945 and 12,055 kHz
1600-1650z 1548, 6170, 7225, 7305, 9615, 11,785, 15,105, 15,415 and 15,595 kHz

To Africa:
0400-0450z 6065, 6130, 7150, 7225, 7275, 9565, 9665, 9765, 11,765 and 13,770 kHz
0600-0650z 11,765, 13,610, 13,790, 15,185, 15,435 and 17,875 kHz
0900-0950z 9565, 15,410 and 21,600 kHz
1100-1150z 15,410, 17,765, 17,800, 17,860, 21,465 and 21,600 kHz
1500-1550z 9735, 11,965, 13,610, 15,145, 17,735 and 17,765 kHz
1900-1950z 9765, 11,765, 11,785, 11,905, 13,790, 15,350 and 17,810 kHz

For North America
0100-0150z 6040, 6055, 6085, 6145, 9515, 9565, 9610, 9640, 9770 and 11,865 kHz
0300-0350z 6045, 6055, 6085, 6120, 9535, 9545, 9640, 9705 and 9770 kHz
0500-0550z 5960, 6045, 6055, 6120, 9535, 9670 and 9690 kHz

Sri Lanka

Religious broadcasting giant **Trans World Radio** has plans to scale up its operations in Sri Lanka with the reintroduction of shortwave services for listeners in the Indian sub-continent.

During the early part of this year TWR will make use of spare transmitters hours at the **Radio Japan** relay site near Ekala in the 2300-0100z time block. This will undoubtedly improve the station's coverage of northern India, where reception of TWR's existing 400 kW medium wave transmitter is not completely reliable. Longer term, two 100 kW shortwave transmitters are to be shipped from Swaziland, where they are being constructed by technical staff from TWR and HCJB. These will be co-sited with the medium wave unit at Puttalam, however in the interim it is thought that a 12.5 kW facility may be brought into service from the site.

Currently, Trans World Radio's programs are relayed by **FEBA** (Seychelles) from 0100-0200z on 9765 kHz in the Telugu and Tamil languages.

*This news courtesy of Victor Goonetilleke in the **Union of Asian DXers**' newsletter.*

Namibia

A schedule received from the **Namibia Broadcasting Corporation** by *Don Phillips* of England shows two 100 kW transmitters in use for domestic programming.

Transmitter 1, into an omni-directional antenna:
1800-0800z on 3290 kHz and **0800-1800z** on 6175 kHz with Afrikaans and German in the National Service. German is scheduled **1200-1300z** and **1800-2100z** (Monday to Friday), **1300-2100z** (Saturday), **1000-1100** and **1800-2100z** (Sunday).

Transmitter 2, with antenna beamed north/south:
1000-1800z on 6060 kHz and **1800-2200z** on 3270 kHz. Services on this transmitter include Otjiherero, Damara/Nama and the National Service.

*This information taken from "**Shortwave News**", the monthly bulletin of the Danish Shortwave Clubs International.*

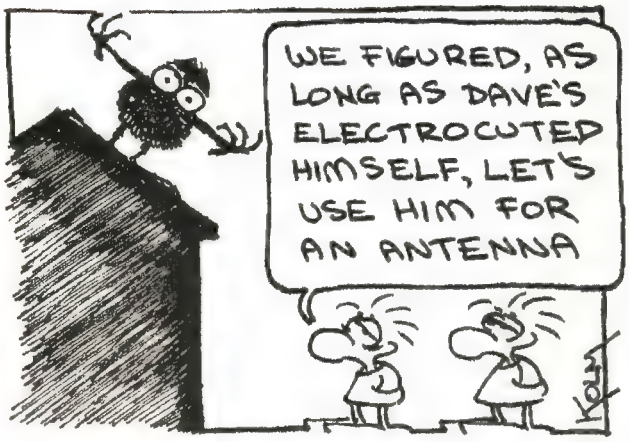
When in Rome...

Radiotelevisione Italiana in Rome has been kind enough to send its latest schedule, which lists several English programs:
1935-1955z 11,800, 9710 and 7275 kHz, for Great Britain
0425-0440z 5990 and 7275 kHz, for the Mediterranean area
2025-2045z 11,800, 9575 and 7235 kHz for the Near East
2200-2225z 11,800, 9710 and 5990 kHz beamed to Japan
0100-0120z 11,800 and 9575 kHz, to North America

The **Italian Radio** also relays its home service programs on shortwave for listeners in Europe: **Radio 1** is on 9515 and 6060 kHz from 0500-2229z, **Radio 2** on 7175 kHz from 0500-2229z and **Radio 3** uses the 75 metre band channel of 3995 kHz from 1500-2125z. Programming on these frequencies is, as one might expect, almost entirely in Italian and emanates from transmitters located at Caltanisetta on Sicily.

China update

Radio Beijing is now operating to its winter schedule, and several frequency changes were made towards the end of 1991. English now goes out as follows:
0000-0057z 11,715 and 9770 kHz to North America
0300-0357z 15,100, 11,715 and 9690 kHz to North America
0400-0457z 11,695 and 11,840 kHz to North America
0900-1057z 17,710, 15,440 and 11,755 kHz to South Pacific
1200-1257z 9665 kHz to North America
1200-1257z 15,450, 11,660, 11,600, 9715 & 8425 kHz to South East Asia and the South Pacific
1300-1357z 11,660, 11600 and 9715 kHz to South East Asia
1400-1457z 15,165, 11,815, 7405 and 4200 kHz to Asia
1500-1557z 15,165, 11,815, 7405 and 4200 kHz to Asia
1600-1657z 15,130, 15,110, 11,575 and 4130 kHz to Africa
1700-1757z 11,575, 9570, 7405 and 4130 kHz to Africa
1900-1957z 9440 and 6955 kHz to Africa
2000-2057z 15,110, 11,715 and 9440 kHz to Africa
2000-2057z 11,500, 9920 and 4130 kHz for Europe
2100-2157z 11,500, 9920 and 4130 kHz for Europe
2200-2227z 3985 kHz to Europe
2200-2257z 7170 kHz to Europe



There is also a broadcast for the Philippines which is well heard in Australia from **1200-1227z** on 15,135, 12,450, 12,110 and 11,445 kHz in English and Tagalog (Filipino).

*This schedule from the **NDXC***

HCJB English schedule

Gospel station **HCJB** in Quito, Ecuador, has this schedule for English:

Americas release:
1130-1600z 11,925, 15,115, 17,890 kHz (15,115 kHz until 1430z only)
0030-0500z 9745, 15,155 kHz
0500-0700z 11,925 kHz
European release:
0700-0830z 9585, 11,730 kHz
1900-2000z 15,270, 17,790 kHz
2130-2200z 15,270, 17,790 kHz
South Pacific release:
0730-1130z 9745, 11,925 kHz
Middle East release:
1630-1800z 15,270, 17,790 kHz

The SSB frequency of 21,455 kHz also carries English at all times above.

Indonesia

According to a report on the *Media Network* program, a multi-million dollar contract has been signed between GEC Marconi and **Radio Republik Indonesia** for the supply and installation of nine 250 kW shortwave transmitters and 20 directional antennas. The equipment is to be distributed between two existing sites, one near Jakarta and the other on the Island of Sulawesi. Initially, the transmitters will be used for the domestic service and it is anticipated that two national programs will be available on shortwave to all the islands in the Indonesian archipelago.

Arrivals and departures...

The shortwave world is never dull, and as usual there is quite a list of stations leaving shortwave, starting up or reactivating after a break.

• **A Voz do Pantanal** would appear to be the new name for the Brazilian on 4795 kHz, known to most of us as **Radio Difusora**. *Julian Anderson* of Argentina heard this new identification announcement at 0958z.

• **Radio Dublin** is widely reported reactivated on 6910 kHz, after a few months absence from the bands. This one should provide reasonable reception in Australia from around 0700z, though I have heard reports that it is soon to move to nearby 6930 kHz.

• *Gabriel Ivan Barrera* advises that **LRA36**, **Radio Nacional Arcangel**, Argentina's radio outpost in the frozen continent of Antarctica, has reactivated its shortwave channel of 15,475.73 kHz (to be precise!). Despite some reports that the station had drifted away on a shelf of pack-ice, the 1 kW transmitter is back with its Monday-to-Friday schedule from 2100-2305z, with announcements in Spanish, English, French and Portuguese. A difficult one from here, but certainly worth a try!

• *David Kernick* in England confirms that the **Albania**n national domestic service is once again regular on shortwave, using 6100 kHz. The *'White Book'* of the ITU in Geneva lists operations on this frequency from 0600-1700z. David points out that programming would appear to be much zippier and more 'westernised' than when the service was last heard on shortwave.

• **Polish Radio** has announced cuts to its service, with Spanish now dropped completely and reductions to German and English output are soon to take place.

• In the *PlayDX* bulletin, *Vashek Korinek* of South Africa advises that **Radio Mozambique** in Maputo is now inactive on 31 and 25 metres. The international service in English is noted on 4865.5 kHz from 1800-1900z.

• An *AFP* report has suggested that **Radio Rwanda** will soon use a new 100 kW transmitter which will enable it to be heard throughout Africa and the Middle East. Mr Ferdinand Nahimana, director of the Rwandan information office, has advised that the station will also launch a second transmitter for French, English and Swahili-speaking listeners. Developments are awaited!

• The recently-inaugurated external service of the **Georgian Radio** from Tbilisi has not been reported of late, and may be inactive. The domestic service second program, usually on 4875 kHz, is also missing, says *David Kernick*.

New Zealand

Radio New Zealand International's current schedule shows relays of the national domestic service from 1800-2206 (Sunday to Friday) on 15,120 kHz, 2206-0630z on 17,770 kHz and 0730-1210z on 9700 kHz.

Occasionally the transmissions extend beyond 1210z on 9700 kHz to cover international and national sporting events.

Australia

Bob Padula tells me that **Radio Australia** introduced a new schedule during December which shows the deletion of RA's only 11 metre band outlet, on 25,750 kHz. The replacement is 21,720 kHz, **0900-1100z** (from Darwin, NT, 250 kW). Also new is 11,720 kHz from the Brandon, Queensland site, replacing 11,930 kHz **1900-1100z**, and 13,755 kHz (Carnarvon, WA, 250 kW) **0900-1430z**, replacing 13,705 kHz.

New station planned

There is to be yet another contender in the Bible stakes on the shortwave bands! A construction permit has been issued for a new station to be operated by the producers of *Prayerline*, which is presently heard over **WWCR** in Nashville. The proposed site is Millerstown, Kentucky. Two corner reflector antennas are planned, with common side, 40 and 150 degrees, with three towers. Two 50 kW RCA AM transmitters would be converted to shortwave, for combined or individual use. Take-off angle would be 10 degrees, 60 degree bandwidth, 14dBi gain. The construction permit was filed in May 1991 by consulting engineers Cohen, Tappell and Everest, in Washington .

*This news from **DX Listening Digest**.*

***Amateur Radio Action**'s **Shortwave Notes** are compiled by **Craig Seager** of the **Australian Radio DX Club Inc**.*

*For details about the ARDXC and a copy of the club's monthly newsletter **Australian DX News**, write to: Hon Membership Secretary, 258 Dandelion Drive, Rowville, Vic, 3178. Please enclose five 45¢ stamps and don't forget to mention **Amateur Radio Action**!*

CW gadgets for the shack

By Neil Duncan, VK3OK and Tom Moffat, VK7TM

The old Morse junkie's eyes light up when someone mentions the CW mode or some enhancement for CW operation. To people like our reviewer Neil Duncan, CW is not only king, it is the only *musical* aspect of the hobby. The low ends of our bands are the stamping grounds of the elite, I sometimes feel. If CW were the outmoded mode that some say it is, then the growing crowds down there would not be.

If you aspire to that full call you need to follow our new AOCP course — but you also need to pass 10 words per minute Morse Code. Perhaps some of the gadgets discussed here may help you on the road to that elusive goal.

The MFJ-1268 Memory Keyer

What we have on hand here is a CW producing system to be used in conjunction with your IBM or compatible computer (and, of course, your amateur rig). For your money you get an MFJ cardboard box, a computer disk, a 42 page manual and a small plastic bag containing an uncomplicated PCB.

The **MFJ-1268 Memory Keyer** is in fact, a transmit-only device which, when everything us installed and running, converts your computer keyboard into a sophisticated CW keying and sending system to be plugged into your rig. The really clever bit is not so much in the hardware you purchase. Rather, it is in the nifty software supplied on the 5.25 inch floppy disk.

The Electronics

Virtually all IBM or compatible computers these days have at least one 'COM' port on the back panel. A COM port does just what it promises — it COMmunicates with the outside world. COM1 on my computer is taken up by the mouse (squeak). Now, the good news is that I have *two* COM ports. The bad news is that the second one is taken up my multi-mode device. Anyway, that is my problem since I simply unplugged the latter for this review. I am sure *you* probably have a COM port spare.

The little PCB which arrives with the kit contains three transistors, five resistors, three diodes, one DB25 socket and two smaller sockets. The poor little thing, including a trailing 9V battery connector, is designed to plug into a 25-pin COM port plug on the back of your computer and stay there without any other means of support.

One of the small plugs on it carries, via an RCA socket, the keyed output to your rig. Another connects to a paddle key in case you want to use your computer as an oversized automatic keyer and the third is for external voltage if that is what you want. The nine volt battery stays connected the whole time as the device draws far less than 1mA when idle. There is a clip supplied along with some sticky looking things to take care of a physically-renegade battery.

As I see it, the computer software sends its output to the COM port and this device converts the low-level computer output at that port to a suitable level to key your rig. In addition, it has a socket for a paddle to be connected in the reverse direction via the DB25 connecter so it can talk to the software, thus becoming an alternative to the keyboard.

The Software

As I have mentioned, it is the software in this kit which strikes me as being most clever. Converting keystrokes into CW in itself in a computer is not all that hard. Indeed, it is the kind of task which is set in secondary schools for bright computer science students. What *is* clever, though, is the 'extra' supplied in the software.

For a start, one corner of the software allows for contests. You know how numbers are given out in those wretched contests? 599 001 then next time, 599 002 and so on, with those last digits being increased by one each time? Well, that's been allowed for here with sequence numbers being automatically added to your own choice of RST numbers.

A second of the software's tricks concerns the automatic generation of part or even whole QSOs. Please, purists, don't get your knickers in a knot. This won't be an example of one computer talking to another computer. In most QSOs, be they on 'phone or on CW, there are several 'mechanical' aspects. As you chat away, you invariably state the type of rig you are running, the signal report and, of course, the call signs at the start and end of a QSO.

This software is able to memorise all that sort of thing and to release it at your pleasure. Remember, too, that an IBM or compatible computer has a heap of memory space available, too! Anyway, you can ask it to pick up 'permanent' information such as your one call, name and rig (etc), temporary information such as the other guy's callsign

which needs to be entered just once, or sections of standard sentences which the computer actually asks you for on the spot. Lines like 'the weather here is' can be pre-programmed in and sent with a pause — and the computer waits for your response. All very simple to use and all very professionally done, too.

Included with the software are all kinds of help screens. By pressing the appropriate keys, you have access to a typical help screen, 10 sets of memory banks, the 'Q' codes, common CW abbreviations, a 'type ahead' buffer, keyer 'weights' and all manner of other things.

Naturally, the computer can also be set up to give code practice and even USA-style exam questions. If the band is *really* dead, you can even make the computer send some typical QSOs to you. Then, of course, the computer can be made to send a file from your own disk. Just select your favorite document from your word processor and *really* bore the other guy for an hour or so! *(Yes, but will it insert the callsigns every 10 minutes? Ha! Gotcha... Ed.)*

The manual is clear, precise and typically MFJ in calibre. It includes everything you might want to know. I note though that it is a bit short on description of the PCB card and how it works but since its circuit diagram is supplied, I guess it won't be too hard to figure out.

Who would want such a combination of software and hardware? Well, I suspect that a novice or 'early CW' user would like it. No, it doesn't receive CW but I have found over several years that the perfect 'mechanical' CW reader for 'hand-sent' CW doesn't exist. There is no shortcut — you need to be able to copy it by *ear*.

On the other hand, computer-sent CW is terrific to listen to. And for myself? Since there ain't much personality to perfect CW, I would mostly use my hand key in preference for the majority of the time. When on a contest or, perhaps, if the other guy is using a computer to receive me, then maybe I might be bothered switching the computer on, looking for the proper directory, firing up the program and remembering how it all works. Others may use a computer for a higher proportion of their CW time.

But the bottom line clearly says this is an MFJ product to be admired and is one which will bring joy to many a user!

Amateur Radio Action thanks **Stewart Electronics** for the loan of the review equipment — the MFJ-1268 Memory Keyer costs $95 plus postage.

The Logikey K-1

Oh, the joy of having *two* CW devices to review in the space of only a few days! The point which pleases me even more is the increasing popularity of CW these days. A simple tune around the DX bands will almost always uncover more CW stations than all stations on all the other modes put together — and for good reason.

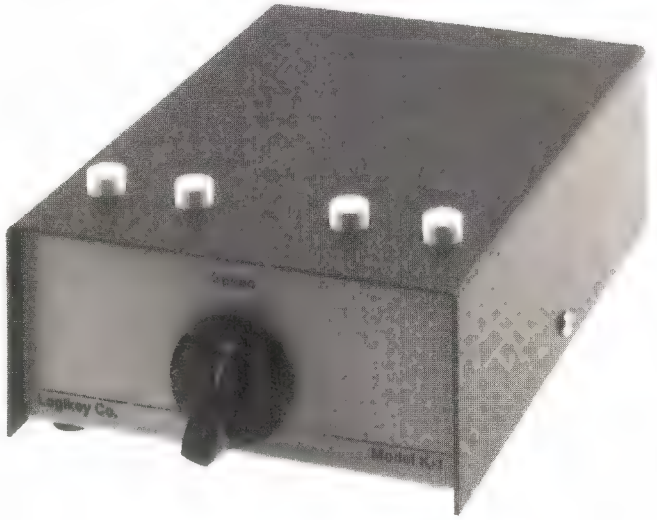
Yet you would think with the availability of telephone-like 'black boxes' that no-one would bother with the hard work required to master the mode. That is not the case. A device such as the one on review here is selling like hot cakes in the US both commercially and in amateur circles and I imagine it will do the same here.

Now, the little box in question looks a little drab — almost innocently so at first sight. It sports one knob on the front and four unmarked white buttons on the top. The knob turns just fine and the buttons quietly go ker-chunk when you press them — but what do they all *do*? I'll tell you what the **Logikey K-1** does — it sends the best CW imaginable and is highly intelligent as well.

Indeed, I am looking at what, for me, is possibly the best CW formatting transmitting combination available. I have tried all manner of keyboard devices — hand keys, automatic and semi-automatic mechanical devices and dedicated multi-mode boxes. In short, the combination of a quality paddle and the K-1 is going to be very hard to top for a wide variety of reasons.

For a start, if you purchase a paddle such as the delicious **Bencher** paddle, you will be needing an electronic box to do the 'automatic' bit. After all, a paddle is nothing other than a two-way switch. Done — the Logikey K-1 has that function built in and it is instantly available as its main personality when you switch the device on.

Secondly, it is capable of memorising useful things such as your call, a CQ sentence, the other station's call sign, RST and automatically incrementing contest numbers all in the most simple and precise way, and it plays any of them back at the mere touch of a button. Oh, and note this: if you are into CW contests, I'd reckon the K-1 is almost a *compulsory* asset. Clearly, this is a product manufactured by someone who loves CW. Being of such ilk myself, couldn't fault it in any real operational sense at all.

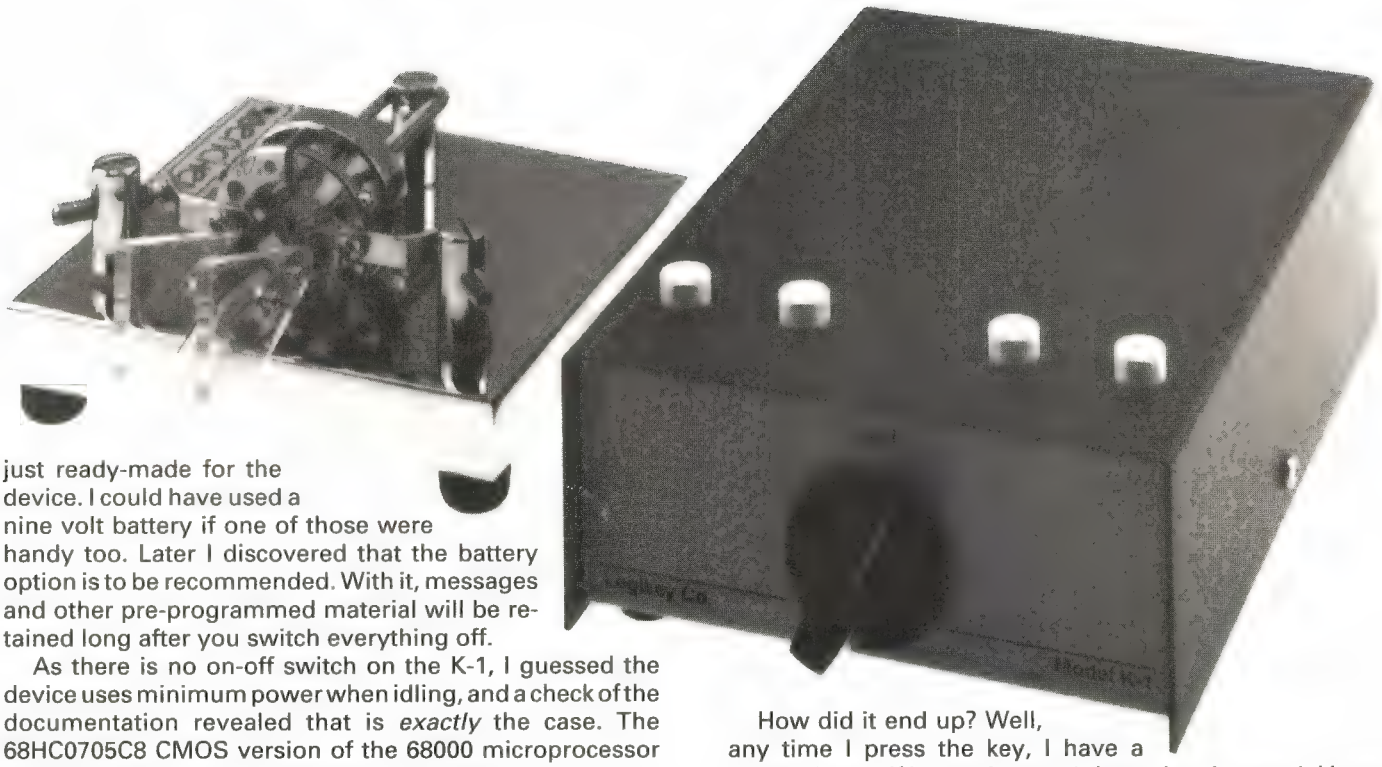


Connecting it up...

The kit of parts I was handed included the austere little box itself, a bag with some extra plugs and an extension cable for making the K-1 a remote control device — even it is only one metre or so long. The only thing I had to do was to connect up the power and assemble a couple of plugs for myself.

After a few minutes with the iron, I had made up a cable with the supplied miniature stereo plug at one end and had soldered the other leads directly to the mechanical paddle. That was one end of the bargain out of the way. Now for the cable from the keyer to the transmitter. That was no problem either — I had one already. You may need one of your own however. Try an RCA plug for the keyer end and whatever else is needed at the rig end.

A mere 10 minutes later I was ready to power it all up. Hey, that's a point, where *does* the power come from? By sheer coincidence, I had a 12 volt source with the right plug



just ready-made for the device. I could have used a nine volt battery if one of those were handy too. Later I discovered that the battery option is to be recommended. With it, messages and other pre-programmed material will be retained long after you switch everything off.

As there is no on-off switch on the K-1, I guessed the device uses minimum power when idling, and a check of the documentation revealed that is *exactly* the case. The 68HC0705C8 CMOS version of the 68000 microprocessor cleverly powers down to less than 1 mA when it is not in use. Batteries last a very long time and for this application that is important. This way, when I enter the shack and want to start up on CW, I just switch my radio and the K-1 is instantly available. Compare *that* with a computer-based CW-generating system when switching on requires you to turn on the computer, change directories, recall how to start the thing, firing up the appropriate program and possible typing in some mystical commands is needed!

Anyway, the K-1 was supplied with an external 12 volt source and switched on. Moments later in my testing, I discovered the device was not set up properly. A small 'jumper' plug inside the thing had to be swapped over so that the correct '+ polarity' keying line for my transmitter was available at the output.

Learning to drive...

My only experience of a device such as this was via the 'thought experiments' I had indulged in when looking at the overseas advertisements for this and similar units. Would it prove to be useful? How would I remember what the various unmarked buttons were for? How *do* you program it — is there a keyboard hiding somewhere?

In short, the manual *IS* needed. Actually, at the risk of being a bit rude, the manual is rather drab. Five double-sided pieces of paper, printed in a rather small and fine print and without any thought to visual appeal... the manual at first is a bit daunting. It is presented in two halves. The first is a set of facts and figures. The second, printed relatively upside down and starting at the other end, is in a 'getting started followed by three lessons' format.

By the time I had finished (about an hour later), I was fully conversant with the facilities of the K-1 and I even apologised to the manual writer for my initial evil thoughts about his handiwork. It is all set down in there and the text is really very well done once you wade through the fine and tightly packed-together format. Incidentally, I appreciated the informal and chatty style used.

How did it end up? Well, any time I press the key, I have a normal keyer. If I press button 1 through to button 4, I have a pre-programmed message forthcoming. I reserve button 4 for the other guy's call sign — which I have programmed to be picked up whenever I press one of the other button too. It is all too simple and useful to be true! (I hasten to add that it *is* true though!)

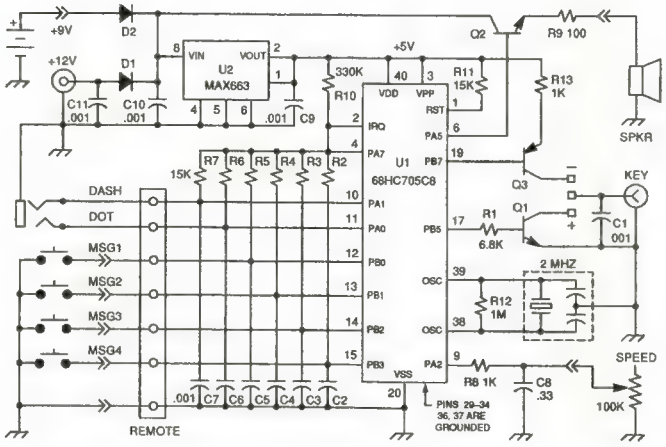
Programming the K-1

Now to the heart of the matter. Would the K-1 turn out be an easy device to program and use? Let's make one point clear — programming the K-1 is done via the Morse key and if your CW is a bit... shall we say *weak*, or if you are a raw beginner, then you may find this aspect difficult. If, on the other hand, your CW is up to scratch (not necessarily at a maestro standard though) then this stage is real *fun*.

Consider the phrase '**CQ CQ DE VK3OK**' which we want to put into the first of the four memories. See that first white button? Press and hold it for a few seconds until the device emits a long beep. Let it go and listen to the —•—• (C) which is sent. Now send good old 'CQ' and wait for the double beep. Send the second CQ and wait for the double beep again. Repeat that for the DE and for your callsign. Finished? Press the white button again.

The double beep signifies that a word space will be inserted. If you make a mistake, hold down the dot key so that at least seven dits come out and the K-1 will replay the last word again then double beep in anticipation. When you have finished, press the white key. There is room in each of the memories for 48 characters which may not seem a lot but proved to be all that I needed.

To replay the first memory sequence, press the first white button briefly again and away she goes. If you press one white button or any combination of the others (with a maximum of eight presses in advance) then the memories will empty their contents in that sequence. How do you stop it from rolling on if you don't really want all that? That's simple — just tap the Morse key and the thing stops instantly and obediently.



That is just the tip of the programming iceberg, but for all intents and purposes it will be the majority of activities for the K-1. One extra, however, is this: if somewhere within the message in memory 1 for example, you put the characters '\2' then right in the middle of replaying memory 1, the entire contents of memory 2 will come out. (OK smarty, if someone's call is AB2CD\2, that is coped with too. See how there is no character before that latest \2? That is how the K-1 knows the difference. A typical use of this multiple memory entry is in putting your own callsign or perhaps that of the other station. *(Isn't a portable operation generally indicated by a forward slash (/) rather than a reverse slash (\)? Ed.)*

Another little trick is to form an infinite loop — perhaps a CQ call — by asking a memory to play itself as its last programmed request. In other words, memory 2 may contain **CQ CQ DE VK3OK /2**. You can program a delay within the loop and, of course, you exit it simply by pressing the Morse key. *(Gee, that'd be a great April Fools Day joke — set it rolling and just leave it burning all day! Ed.)*

I found a major attraction of the K-1 hiding away in its contest mode. The device can produce a *sequence number* on request — just embed the appropriate command in a memory and when that memory is sent, the next number (001 then 002 etc) in the sequence will be transmitted. The initial value and format for such a number can be selected from a long list. Naturally, any errors can be erased. As I have said, someone at Logikey knows their CW and their on-air routines.

If you look underneath the K-1, you will find a list of 'codes' printed there. Some of them relate to multiple presses of the buttons on the top of the unit and some relate to sequences you have to send via the Morse key. Some examples are:

- converting to hand key mode
- reversing the paddles
- adjusting the contest numbers
- setting speed.

There are many more ways to adjust the K-1 via the buttons on the top and I found myself memorising the useful ones very quickly. The majority of features are available via the Morse key and those I found to be even more amazingly simple.

In short, the K-1 keyer is reliable and effective to program and those codes which are not trivial to memorise are printed underneath!

Summary

The Logikey K-1 keyer will meet a need for the ardent CW buff or professional. The nearest I have come across elsewhere is a far more complex commercial unit which looks ferocious. There is also the one I have seen in the ARRL Handbook. In either case, the K-1 keyer makes a mockery of all the rest with its simplicity.

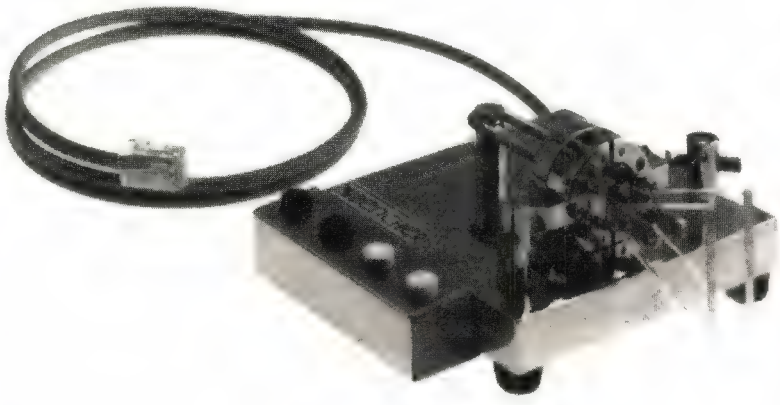
I like the K-1 for a variety of reasons but mostly because of the obvious 'simple-is-beautiful' philosophy inherent in its design. There is no on/off switch and there are no complex switches or special things to do. The device is instantly available on request either as a keyer or as a memory device. I found it to be a top performer and a wonderful asset to this CWer's shack. Top marks, Logikey!

Amateur Radio Action thanks **Stewart Electronics** for the loan of the review equipment — the Logikey K-1 keyer is catalogue number MM008 and costs $248.40 plus postage.

The *real* key to Morse Code success

"What this world needs is a really good Morse Code key."

No, we shouldn't say that. This world has always had good Morse Code keys. Our mission in life is to make sure they don't *disappear* from this earth. Certain forces, in the name of 'progress', are trying to submerge Morse Code in the annals of history. Other forces, who many say are already submerged in the annals of history, keep trying to drag Morse Code back to the surface. Well, it ain't down yet, folks, if they keep making things like the **Hi-Mound** keys.



Who would think there would still be a market for big heavy precision-tooled gadgets which are little more than spring-loaded switches? Well, there is a certain feel for such things, made in the ways of the 'good old days'.

It makes me think of an electric kettle we have down at our beach house, an elderly Hecla device which must have come from the 1950s. It was made with liberal lashings of steel and bakelite, and it works today as well as it did the day it came off the production line. As well as boiling up the water, the old kettle just feels good in the hand; it gives a feeling of stability and the times when there was pride in the workmanship and when the *best* things were made in Australia.

Makes me sound like an old fogey, doesn't it — raving on about Morse Code and tea kettles. But there are still some top guns in the Morse business who are in their twenties and proud of it. They demand the very best, even though lesser instruments would do the job. It reminds me of playing eight-ball in the pub. Everybody's doing all right with the sticks from the rack on the wall, and then along comes this guy with this case under his arm. In it are two rods which screw together — a custom pool cue. It might not be much different from the pub's cues, but it makes HIM feel like he can slay dragons with it, and it makes his opponents tremble with fear — this guy Means Business! *(Doesn't help me win the game, though! Ed.)*

So it is with the current crop of Hi-Mound Morse keys. Liberal lashings of steel and bakelite. Well, not *exactly* bakelite... I guess that stuff is gone forever, but solid black plastic is a pretty good substitute. With these in your hands you *know* you mean business, and you feel like you can slay dragons. I recently received two Hi-Mound keys to look at, a traditional 'straight key' and a more modern Iambic key for an electronic keyer.

I remember seeing the Hi-Mound straight key advertised in magazines for at least the last 20 years. As far as I know the one which turned up this week, the model **HK-707**, is the same that's been advertised for all that time. There's no reason it should be any different — if it works, don't fix it.

Hi-Mound: does the name refer to the big black lump which shows up in the photographs? What's inside the big black lump? I found out soon enough when I picked the key up by the lump and it came off, leaving the key seated firmly on the table.

I can now reveal that the big black lump hides the normal guts of a Morse key of the 1920s era. It's all a little more modern, admittedly, but it's the same works. There are the switch contacts, appearing to be machined from brass. There's an adjuster at one end for the amount the key travels between its up and down stops, and an adjuster at the other end for spring tension. In between is the works upon which the whole thing pivots.

On most Morse keys these are simply pointy bits which fit into depressions on the key's frame. But on the Hi-Mound, the supports for the moving part of the key look like they were designed to support railway wheels along with their roller bearings. Trying to jiggle the key back and forth produces no movement at all, so whatever's in there is pretty solid.

That black cover, the 'high mound', is obviously there to protect the innards from dust and damage. That's a good idea; every time I've had a Morse key play up, it's been because of dust in the contacts. With the cover in place the key looks rugged, strong as an ox, capable of slaying dragons with ease. *(Yeah, but does it send Morse? Ed.)*

I gave the key a pretty good operational test, but I found it a little heavy-handed for my taste. I was brought up one one of those classic Bell Telephone Morse keys made of solid brass, the thing which has become known as the 'American Key'. Now my straight key is an AWA model from World War II, mounted on an oak base with a nice little AWA nameplate screwed to it. Both these keys are small and delicate, to be operated with a feather touch.

The knob on American Keys is always flat. The knob on British keys is always round, as is the knob on my AWA straight key. Hi-Mound is obviously looking toward both markets; its knob is — how would you say — rounded flat. It felt pretty good to this Yank, and I'm sure Morse-minded Poms would find it satisfactory too. The Hi-Mound could easily survive the pounding of a hot and heavy contest, even in the hands of not-very-skilled operators. Anybody who tried to break it would break their fingers first. If you buy one I'll just about guarantee it will outlive you.

The **Hi-Mound MK-706** electronic keyer paddle is a little more modern — it looks like it might have come from the 1960s. At first glance it reminds me of one of those big plastic-cased relays we used to get out of disposals gear. Sticking out the front is a pair of black plastic paddles, carefully moulded with ridges to give them strength. Under the plastic cover, clear and see-through this time, is a lovely bit of precision engineering.

Starting from the bottom is a heavy iron base, painted in grey crinkle paint. How long has it been since we've seen that paint? It used to be the standard finish for rack panels. Remember rack panels? Another blast from the 1960s. Above the base is a flat-grey colored structure which holds the whole key together. This is strange stuff — it looks like it could be plastic but feels and sounds like metal when you clink it.

And on top of it all, the works! There's a pivot allowing the two paddles to move sideways independently. Further forward are adjustable springs and, further forward again, independent contacts for each of the paddles. The arrangement is much like what you'd have if you got two straight keys, laid them on their sides, then stuck their bases together.

Forward of the keyer mechanism is a nameplate announcing that this thing is a 'manipulator'. Now, I always thought that a manipulator was part of the apparatus which connected the big control panel to the brain of Frankenstein's monster. Come to think of it, this manipulator could have come from that very control panel, or at least the one which shot rockets into space in 1950s science fiction films.

No, let's get serious. My own electronic keyer is of the Bencher variety, a spaced-out looking thing of the most delicate construction. It operates with the touch of a feather and costs a fortune. It's got bits sticking out everywhere and I'm always afraid of breaking it. The Hi-Mound, on the other hand, is of a much simpler design. Yet its touch is almost as light as the Bencher's.

The iambic paddle type of keyer produces continuous dits if you press against one paddle, and continuous dahs if you press against the other. If you squeeze both paddles together the keyer produces alternating dits and dahs. Once you learn to drive one you can send Morse at blinding speeds with very little hand movement. But when you do move your hand you expect a quick and delicate response.

I hooked the Hi-Mound keyer to a home-made electronic keyer and babbled away to myself to get the feel of it. This was better than on-air, since I could send all the time without bothering to listen (no rude comments out there, thanks). *(Shucks. Ed.)* The Hi-Mound was very, very nice to use. My only preference would be for the paddles to be a little further apart, as they are on the Bencher. But maybe I prefer them that way because that's what I am used to. If I were looking for an iambic keyer paddle right now, I'd give the Hi-Mound MK-706 Manipulator very strong consideration. Even *with* that funny name.

Amateur Radio Action thanks **Dick Smith Electronics** for the loan of the review equipment — the Hi-Mound MK-706 Manipulator is catalogue number D-7108 and costs $89.95, while the Hi-Mound HK-707 straight key is catalogue number D-7107 and costs $59.95.

ON-SIX *BONUS*

TV Carriers

During recent trans-Tasman and Pacific DX carriers were noted on all the right spots as reported in the WRTVH so we can only assume that if they got Oceania correct then the rest of the world is also right. Below is set out some of the carriers you can expect to hear and identify by their exact offset from the nominal assigned frequency, which is usually .250 or .750 world wide, with power levels above 1 KW.

Frequency	Video type	Grid	Location or area served.
45.240	PAL	RF72	Waikato,Te Aroha. 100 kW.
45.250	PAL	RE43	Mt Hedgehope, Southland. 100kW.
45.250	PAL	RE78	Kaukau Wellington NZ. 100kW.
45.260	PAL	RE33	Mt Murchison, Nelson. 2kW.
45.260	PAL	RE66	Mt Pearce, Cantebury NZ. TV-1 0.5/1kW.
45.2604	PAL	RE44	Queensbury, Otago. 100 kW.
45.2604	PAL	RF64	Hikurangi, Northland NZ. 10kW.
45.2604	PAL	RF80	Whakapunake East Coast NZ. 10kW.
46.2370	PAL	QF53	Translator Buckeridge Lookout, Narooma NSW 500 W
46.240	PAL	QF35	Mt Ulandra, Wagga NSW.100 kW.
46.258	QF58		Bald Hill, Tamworth NSW 1 kW. Translator.
48.2396	PAL	JN39	Goettelborner Hoehe Germany, 100 kW.
48.2396	PAL	JO79	SVT-1 Oerebro Sweden, 60 kW.
48.2400	PAL-B		Kotakinibalu Near Brunei Malaysia:
48.2422	Vision	IN51	NRK-1 Muro, Portugal, 40kW.
48.2447	V-PAL		Malaysia, location in east.
48.2450	6M25C3F		Middle East reported by TV DXers.
48.2461	V-PAL	JP21	NRK-1 Gulen, Norway, 30 kW.
48.2474	V-PAL	JO40	Biedenkopf Germany, 100 kW.
48.2476	Vision		Malabo, Equatorial Guinea, 1kW.
48.2487	V-PAL	KP59	NRK-1 Varanger, Norway, 30 kW.
48.2496	PAL-B		Southeast Asia. (Heard in Hawaii.)
48.250	6M25C3F	IJ38	Aberdeen Point, Freetown, Sierra Leone, 1kW.
48.250	6M25C3F	KJ70	Timboroa, Kenya, 10 kW.
48.250	6M25C3F	LL75	Tarif, United Arab Emirates
48.250	6M25C3F	LL75	Trade centre, RTV Dubai, United Arab Emirates, 150kW
48.250	PAL-B		TVM-1 Limbang, Malaysia, 13 kW.
48.250	PAL-B		Kissi, Ghana, 5 kW.
48.250	PAL-B		RTVM-1 Genting Sempah, 112 kW. Malaysia.
48.250	PAL-B		TTL-1 Fih, Lebanon, 1.1 kW.
48.250	PAL-B		TTL-2 Jounieh, Lebanon, 1kW.
48.250	PAL-B		TTL-3 Beit Mery Lebanon, 1kW.
48.250	PAL-D	IN80	Navacerrada TVE-1 Madrid, Spain, 250 kW.
48.250	PAL-D		Bangkok Thailand, reported by KG6DX.
48.250	PAL-D	IN52	TVE2-Galacia Santiago de Compostela Spain, 40 kW.
48.250	PAL-D	JP03	SVT-1 Vaennes Sweden, 60 kW.
48.250	SECAM	JN76	Podpeca, Yugoslavia.
48.250	SECAM		La Misere, Seychelles, 1kW.
48.250	V-PAL	JN36	SRG-1 Bantiger, Switzerland, 47.9 kW.
48.2508	PAL-B		Malaysian offset.
48.2526	PAL	JO38	NRK-1 Greipstad Norway, 60 kW.
48.2561	JP53		NRK-1 Melhus Norway, 100 kW.
48.2580	6M25C3F	KH41	Gweru Zimbabwe, 17.6 kW.
48.2604		JP77	Steigen Norway, 60 kW.
48.2604	PAL-B		RTVM-1 Cameron Highlands, West Malaysia, 2kW.
48.2604	V-PAL	JN57	Grunten, West Germany, 100 kW, HP.
49.224	13M1C3F	JN25	Arbresle, France. Vision carrier. Sound 55.724 AM.
49.250	13M1C3F	JN42	Bastia Ser Pig 10 kW Video. (Sound 55.750 MHz AM.)
49.7396	7M25A3F	JN97	Budapest, Hungary, 150 kW HP.
49.7396	SECAM	JN79	Praha CTH, 150 kW.
49.7396	SECAM	KN29	Lvov UKR, CT-1. 150 kW.
49.7409	7M25C3FM	KP78	Lovozero USSR. 10 kW.

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49.7448	7M25C3F	JN86	Nagykanizsa Hungary, 50 kW. Vertical.
49.7474	PAL-B	C1	China.
49.7476	SECAM	KO85	Moscow USSR, 300 kW.
49.7500	PAL-B	JN78	St Polten, Austria, 60 kW Ch E2A PAL (5.5 SC):
49.7500	SECAM	JN99	Ostrava, TCH. 100 kW H.
49.7500	SECAM	KO33	Minsk, 150 kW.
49.7502	SECAM	R3	Vladivostok, URS 7 kW. 131E56, 43N10.
49.7513	SECAM	JO93	Bydgoszcz POL 120 kW.
49.7578	7M25C3F	KO56	Novosokolniki, Russia, 90 kW
49.7600	SECAM	KP63	Sukhozero Russia, 10 kw.
49.7604	7M25C3F	KO06	Kuldiga and Ovrutch (KO41) USSR, 50 kW.
49.7604	SECAM	KN79	Rostov-on-Don and Unetcha (KO91) USSR.
49.7650	PAL-B	C1	Chinese outlet.
54.000	SECAM		French outlets 30 kW and 100 kW.
55.2400	NTSC.		Alaska, Hawaii, Washington State, Utah.
55.2400	PAL-B	RF74	Waiatarua, Auckland. NZ, 100 kW.
55.250	NTSC	AH56	Mt Alava, Pago Pago, Samoa, KVZK-TV 72 kW.
55.250	NTSC		DWWX-TV Quezon 40kW.
55.250	NTSC		Philippines network, Davao 5 kW.
55.250	PAL-B	OK03	Bangkok, Thailand, 650,000 watts.
55.250	PAL-B	RE79	Wharite, Manuwatu, ZL. 100 kW.
55.250	PAL-D	LS86	R2 Argentina, 100 kW.
55.2600	5M25C3F		Fairbanks Alaska: CBUT-TV Vancouver B.C.
55.2600	5M25C3F		KHON Honolulu: Oakland California; Mexico/New Mexico area.
55.2600	6M25C3F	RE55	Mt Cargill, Dunedin, Otago, 50kW.
57.100	V-PAL		Wynyard, Tasmania. Wide Offset Video, 1kW.
57.240	6M25C3F	QF24	Mt Alexandra Victoria. 100 kW.
57.250	6M25C3F		Ajjaccio, 10kW France,
57.250	6M25C3F	QF03	Mt Burr SA. 100 kW.
57.250	6M25C3F		Serres 20 kW, SECAM.
57.250	V-PAL		Narrogin W.A. ABW2 Translator, 1kW.
57.260	6M25C3F	QF34	Mt Barranduda Vic. 100 kW.
57.750	PAL		China C2 Asiatic regions.
57.760	Vision		Chinese and Vietnamese channel 2.
58.250	V-PAL		Monto Qld. Translator wide offset, 1.2 kW.
59.2396	FMSC		Monte Nerone Italy, 3.4 kW sound carrier.
59.250	SECAM		Mongolian TV Ulan Bator. 5 kW.
59.250	V-SECAM		CT-1 Komsomolsk 10 kW.
61.250	NTSC		Video carriers Channel 3 USA.
62.2266	VPAL		TV2 10w t/l Picton, Nelson.
62.2370	VPAL		NZTV-2 1 watt translator, Ngarara, Wellington.
62.2370	VPAL		TV1 lp t/l Karori South, Wellington.
62.2370	VPAL		TV2 200 watt T/L Opunake, Taranaki.
62.2396	VPAL		NZ TV2 Te Aroha 100kW Outlet, Waikato.
62.2396	VPAL		TV1 5w t/l, Redwood, Wellington.
62.2396	VPAL		TV2 30w t/l Blaketown, Westland.
62.2400	VPAL		TV1 100 kW outlet, Sugarloaf, Canterbury.
62.2474	VPAL		TV1 LP T/L Northland, Wellington.
62.2500	VPAL		TV1 Low power translators, Naseby Otago.
62.2500	VPAL		TV2 10kW t/l Hikurangi, Northland.
62.2502	VPAL		TV2 10kW High Power.
62.2526	VPAL		TV2 Low power translator Newlands, Wellington.
62.2578	VPAL		TV1 lp t/l Aro Valley, Wellington.
62.2600	VPAL		TV2 High Power 100kW outlet, Hedgehope, Southland.
62.2604	VPAL		TV1 5kW t/l Grampians, Nelson.
62.2630	VPAL		TV2 l/p t/l Havelock Pilot, Nelson.
62.2734	VPAL		TV1 1w t/l Golden Gate, Canterbury.
64.2400	Video		Channel 2 Brisbane, high power.
64.250	Video		Australian TV Channel 2 ± offsets.
64.250	Video		Translator Warrnambool Vic 3500w.
64.2600	Video		High power Channel 2 outlets, Australia.
67.250	NTSC		US Channel 4 video carriers.
69.750	FMSC		Channel 2 TV sound Australia.
71.750	FMSC		Channel 4 US Video, also Philippines.

Operating Ethics

My other hat is assistant to the WIA Federal Awards Manager, where on a week-by-week basis I scrutinise and accept cards for DXCC credit under the Australian awards program. Generally the rules which the WIA DXCC uses for adjudication are the same as those printed on page 1 of ISBN 0-87259-215-4 printed by the ARRL, which also happens to be the custodian of the IARU awards such as Worked All Continents. Whilst the WIA's Federal Awards Manager can inspect WAC cards and send an endorsement to the IARU to issue this award, he does not see ARRL DXCC awards and these cards must be sent to the DX awards manager in Connecticut at the applicant's cost and risk.

With regard to operating ethics, the ARRL is quite specific about fair play, good sportsmanship and operating practices, and in the event that a complaint is received about any individual, it could be actioned by the ARRL awards committee and the potential candidate disqualified from obtaining an award. For the above this also applies to confirmation procedures and documentation submitted including cards which are submitted as proof towards awards. The pertinent government regulations established for amateur radio in the country of origin must also be adhered to and a statement to that effect is signed with each award application.

As 1991 was a year of turmoil and disagreement amongst the six metre group in Australia, including accusations of widespread cheating and abuse of six metre privileges, I think the time has come to set things straight, because those of us who aspire for DXCC will have the decision made for us when we finally submit for DXCC.

Each DXCC participant must stipulate that he/she has observed all DXCC rules as well as all government regulations established for amateur radio in Australia.

The WIA DXCC awards program has in its files information which affects the validity of some of the contacts which have been claimed in the *Amateur Radio* magazine standings list, a point which VK1RX, VK5LP, VK6KZ and many others tried to make in 1987 when "Us East Coast operators" seized the band and operated outside of the guidelines laid down by DoTC for six metre occupancy.

And who could blame us? I even used to talk to a radio inspector on 50 MHz and had been using the band since ATV-0 went off the air in 1984, which was what we were told would be the single criterion for occupancy. Notwithstanding all the past history, recriminations and counter-claims, we now approach a dilemma where, just as the 24 stations operating from Albania last year didn't sway the DXAC into granting credit for the contacts made with other than ZA1A on 20 metres, the 200 stations operating outside the conditions printed on their licences for 50 MHz will have to be addressed.

Does anyone out there have any documents or written proof that we weren't breaking the law when we occupied 50 MHz before July 1, 1987?

Well I hate to be the bearer of glad tidings, but actioned by a previous FAM, the rules for DXCC state that cards after July 1 1987 only, count for DXCC credit from stations in east coast Australia, and the rest will have to sign a declaration that they operated in accordance with the rules which legally bound operators at the time. No one on the east coast can sign this affidavit without lying unless they genuinely believed that they were approved for such an operation and can produce written evidence to this effect, not heresay.

The bottom line is unless we can pull something out of the box soon the ARRL DXAC will be bound by the WIA policy that these contacts will not be valid. You don't *really* expect the WIA to go against government rules do you? Be aware that the ARRL just refused credit for 3X1 contacts, also EA8 on 50 MHz and that anyone who worked OK before December 15, 1991, or BV after the July 1-3, 1991, test have contacted invalid and illegally-operating stations and both the RSGB and ARRL are well aware of these facts.

BV4AF has been sending packets out all over the world about these illegal operators, which is why they only give out PO Box numbers in an effort not to be apprehended while operating illegally. So just like them, under the law and regulations before they were changed in July 1987 some of us operated outside of the regulations which existed. If you have anything to say on this matter, your letters can be sent either to the editors of either magazine, the FAM, or myself. Like most of you I stand to lose about 10 contacts of my current total of 80+ countries and, in fact, if we all lose credit for contacts on 50 MHz before July 1987 the standings list would reduce to typically 65 countries for everybody, give or take a few.

Courtesy is catching...

A report from UK sets Australia at the highest percentage of non-return of QSL cards on six metres and the *least* likely to include even a self-addressed envelope with their QSL requests. One JA1 had 53 cards returned from 257 submitted to various stations throughout VK, requesting cards for various awards such as VUCC and WAVKCA. Remember the final courtesy of a QSO is a QSL card, so lift your game Australia!

Slovakia worked

In the early hours of 15 December, 1991, the first OK stations came on 50 MHz. At 0128z, just before PAØOOS was going to pull the plug there was a Meteor Burst with a CQ of OK2BTI in high speed CW coming through. There were a few long bursts, all together about a few minutes of copy. The signal peaked to a 569 just as the contact was complete. Other OKs were active too but couldn't be heard in The Netherlands.

Contacts to SM3BIU, SMØKAK, SM3JGG, OH3MF, SM3EQY, OH2LQO, OH1LEU, SMØLKE, YT3ET and YU3ZV were made via MS but the only F2 here was HC5K and HC1BI at 1425z.

This report from Jaap PAØOOS.

And from PAØHIP...

Weak auroral (GM; LA) on December 16: F2 Prop at 1435z to East Coast USA and Canada (W1, 2, 3, 4, VE1, VO1) PAØHIP worked grid squares EL96; EM74; FM18; FM19; FN32; FN41; FN42; FN65; FN74; FN84; GN27; GN37. F2 propagation to Asia and Oceania on December 25 and 26 to VS6BG and

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VK3OT. DX worked France, Italy, Slovenia, Sweden, Finland, Norway, Slovakia, Sardinia Island, Netherlands and U.K.

This report from PAØHIP @ PI8HWB.

New VK State records

Mike Farrell, VK2FLR, not content with gaining the VK2 50 MHz distance record in mid-November by working GI4JCD on Jersey in the English Channel, broke his just-established record by working the Azores on 50 MHz, almost 20,000 km away.

Eric, VK5LP, has been awarded the VK5 short-path record for his contact with P43AS Aruba, Dutch West Indes over a distance of 16,100 km, made in April 1989. All the original records set in Cycle 21 on six metres have been replaced by greater distances.

Thanks to WIA for this news.

NZ six metre records

At 0914z on November 11 contacts were made by ZL2KT, ZL2TPY, ZL2UBG and ZL4AAA with IK4XCC, IK4BHO and YU3ZV for the first-ever recorded into Europe on 50 MHz. ZL2TPY also worked Japan and Ogasawarra Island after 1300z on the same day. The next day around 2000z until 2100z, some 45 contacts were made from NZ to north-east USA and Canada, with VE1, VE3 and New England stations worked in Maine, New Hampshire, Vermont and Massachusetts. The following morning at 1817z ZL1ANJ contacted Morocco and CN2JP/CN8ST on SSB as did ZL1AKW and ZL4AAA at 1823z, for the first African contacts ever made. It is now possible for a WAC to be issued to a ZL amateur.

Martin, ZL1ANJ.

VK6PA reports

Steve worked many overseas stations during the month of November from Karratha. With conditions to Europe extremely good resulting in frustration for those concerned who failed to recognise that the distance from VK6PA to the east was over 4000 kilometres and that is why so few Australians were audible. The path existed almost daily from 0800z to after 1130z into Europe.

04 Nov: G, F, LX, DJ, ON, PA.
05 Nov: YU, GU, GJ, DK, IK, G.
06 Nov: JA.
07 Nov: LA, OZ, SM, DL, PE.
08 Nov: JA.
09 Nov: JA, VK8.
10 Nov: JA, VS.
11 Nov: K6, I, F, DL, YT, OH, OE, SV, ON, JN, LX, CN.
12 Nov: ON, SM, DL, PE, FC, JJ, LX, CN, OZ, I2, G, OH.
13 Nov: PA, DJ, ON, OZ, SM, I, F, OH, G, YU, LA.

VK6PA has 42 countries worked and 23 confirmed plus two heard but not worked.

VK to Europe again...

Neville VK2QF sends a short report for November and early December showing contacts with TI2HL, TI2NAS, W5VAS, K5GE, KB5NE, WB5GDN and WB5HJV, all from North America. He also worked stations in Oceania with FK8EB, VK9ND, FO5DR and ZLs. European contacts for the month were IK1EGC and IK2GSO on November 24 1991 after 1030z and on November 27, 1991, with CU3/N6AMG.

Further south, conditions in late November permitted contacts with G3ZYY, G3RFS and G3WOS at 0930z on the 26th and 9H1CG at 1130z on the 27th. In December, three years to the day since OH1VR had heard signals from VK3, a similar path occurred from Scandinavia for SM6CMU in Kungsbacka, who was contacted at 0920z. Signals appeared in the midst of a VK6 opening and it became very difficult to separate the VK6 and Swedish stations on the air at the same time.

EA6, ISØ, IK1, IK2 and SM6 were all audible in VK3 amongst local contacts. Grids worked were JO57, JN35, JN41, and JN45 around northern Italy and France. TV signals were audible from 0800z and contacts made from 0900z until 0930z. The European TV signals from Rostov-on-Don (49.7604 MHz), St Polten (49.750 MHz), Lyon (49.224 MHz), Stavanger (48.2526 MHz) and Vaennes (48.2396 MHz) all pointed to a good path, IK2GSO answered a CW call on 50.155 MHz at 0917z at 559 so the path was good to the region for over 20 minutes.

Australian E contacts continued unabated during the opening, severely restricting the frequencies which were clear of traffic. The following evening the path re-occurred, this time without the distraction of the E layer. The VK8VF beacon and most of the Japanese beacons were all audible from after 0300z and by 0800z VS6BG had a good circuit into Scandinavia, which every now and then would extend into VK regions.

VS6BG worked LA9ZV, SM6CKU, PAØOOS, F6CER, YU3ZV, IK2GSO and heard EA6/DJ3OS, whilst YU3ZV, OH2BC and SM6CKU were all workable in VK3 around 0920z. The JA beacons and 49 MHz TV were audible the whole time, but no sign of Misa from Vladivostok, where he was to sign EKØJA from the QTH of Mike UWØMF, which came as no surprise seeing their operating hours were restricted to 1800z until 2100z outside of TV viewing periods.

New Year's Eve produced an early path into Spain around 0730z when the two TV outlets from that region were copied over Mt Gambier to the west of Hamilton. There was simultaneous propagation into New Zealand and ZL2KT also had the TV signals I was hearing. Attempts to contact LA9ZV on 50.105 MHz were fruitless as the MUF wouldn't budge above 49.760 MHz where the Rostov-on-Don TV signals were so loud. The path gradually short-

STOP PRESS!

European TV video carriers and some brief evening openings into Scandinavia from VK3 during early January were the prelude to the first significant opening into VK6 in nearly six months from the European community.

VK6ZRY called on January 12 to announce that VK6RO and VK6HK featured in an hour-long opening from Perth into countries bordering the English Channel and the Baltic Sea.

Stations in Norway, Sweden, Finland, Denmark, England and The Netherlands were contacted between 0900 and 1030z, with some signals up to strength 9. The fact that it was a Sunday morning in Europe contributed significantly to the number of stations available during the 90-minute window.

You can fax your last-minute notes to Steve on (055) 71 2222, or send them via packet to VK3OT @ VK3JAV.

ened and the high power TV outlet in the United Arab Emirates on 48.250 MHz became audible at 0835z followed by the strong Vung Tau outlet on 49.750 MHz Vietnam, the JA5FFJ beacon and JA5CMO who worked VK5 stations on the calling channel at 0845z.

By 0900z the European path was closed and all the Asian radio signals in the 47 and 48 MHz band were audible including personal phones and tone-modulated carriers. At one stage there was a TV video carrier on every known offset frequency from 45.240 MHz in the New Zealand allocation up through the 46 MHz Australian band, 48 MHz and 49 MHz Asian outlets, extending into the higher VK and ZL outlets on 55.250 MHz, 57.250 MHz as well as Chinese and Russian Channel 2 outlets on 57.750 MHz and 59.250 MHz respectively. See the article which follows regarding the peculiarities of the TV low bands used by different countries.

Pacific DX

On Christmas Eve a 90-minute opening netted NI6E around 40 contacts with VK1, 2, 3, 4 and 5 areas when he heard the VK3SIX beacon at 0600z and commenced calling on 50.105 MHz. Signals were up to S9 at times and occurred from widely-separated areas of south-eastern Australia. On December 27 following a previous solar event KH6 signals appeared in VK4 at VK4DDC whilst N5JHV had VK2 video for three hours and ZL audio signals.

NI6E copied the VK3SIX beacon again on December 29 around 0630z and worked a few stations on 50.120 MHz SSB. The KH6HME beacon was audible on 50.062 MHz up to 0530z and KH6HH was worked on 50.110 MHz at 0700z. On December 30 V73AT was worked by VK2 and VK3 stations with an extension via north Queensland.

The following day the beacon from 3D2FJ was audible at 0030 on 50.084 MHz and VK4BRG on 50.077 MHz but no two-way contacts with the Pacific region took place.

According to Jack, T3ØJH, C21BR and C21RK are both capable of coming up on 50 MHz but efforts on his part seem fruitless to get these operators on the air. The only hope for Australians to work this rare location could be when Jack again stops in Nauru during February before a five-week visit to T3Ø, Tarawa.

Report from JH1WHS

Yutaka has sent me a very comprehensive list of contacts made during October and November 1991 as follows.

Oct 13: VK1, VK2, VK3, VK4, ZL4AAA, XU1U, KG6DX, ZBØT.
Oct 14: VK3, VK4, V73AT.
Oct 16: VK4FP, VK4JH, OZ1LO, OH2TI, ZBØT, 9H5EE.
Oct 17: 9L1US, PYØFF, VK3, VK4, OH2s, VS6BR, VS6YAI, VS6XOS.
Oct 19: VK2, VK4, OH2BC, OZ1LO, IK1LUT, IK4BHO, OE6DGG.
Oct 21: CX4HS, ZL1MQ, VK4, VK6.
Oct 22: LU8AJK, LU1BQU, CEØDFL, VK4, 9J2HN.
Oct 27: VS6BI, VS6YES, XX9SZ, VK4.
Oct 29: VK2, VK3, VK4, VK5.
Oct 30: LU7DZ, LU4DHD, LU8EEM.
Nov 06: VK4, AH6LM, PY5CC, KH3AF, V63JH.
Nov 07: ZL2, VK3, ZL3, VK3SIX, V63JH, ZL1, VK5, HS5SEA, HSØB.
Nov 11: VK9ND, AL7C, ZL3, KH6IJ, VK7XMT, VK3, VK4, VK5, VK2, VK1. AA7A, WB7FDQ, W9RU, K7ICW, K7PRS, WA6BYA, HC5K, WN6W, WA7JTM, W7CI.
Nov 12: NL7OW, K7TLX, KC7IJ, KE7NS, K7VNU, W7KNT, KL7Y, WB7DHC, WA6PEV, AE6P, KL7CC, N7LFX, W7LNG, N6AJ, AH6LM.
Nov 13: K6KLY, WA6UQV, AD7T, K7GGJ, VE6BCC, AA6DD, WW6J, WA7KYM, W7INX, W7RV.
Nov 14: WA7JTM, K6IBY, K6MMT, VE6TMA, VE7BMR, N7CFO, K7DZE.
Nov 15: WA7TDZ, WØKEA, K7TRE, WA6BYA.
Nov 16: VK1RX, VK3OT, VK4ABW, VK5BC.
Nov 17: N5JEH, W7GZ, K6IBU, NF6L, AD6C, N6AJ, W6UE, XE2/WB9AJZ, KB6KQ, AJ6F, KA6VNU, N6HBI, WB6JJE, AJ6T, KB6OK, W6YEP, K6FV, K3QM/6, WB6FCS, KB6NAN N6DX, VK3LK, VK3OT, VK4AFL, VK4WHO, VK5DX, VK5ZAH, P29PL.
Nov 20: ZL2TPY, ZL2KT.
Nov 24: ZL2TPY.
Nov 25: VK3DUT, VK3AUI.
Nov 27: ZL2TPY.
Dec 02: VK7SA, VK7BE, VK3AMK.
Dec 05: ZL2AGI, ZL2KT, ZL2UJH, K7VNU, W7FN.
Dec 06: VK stations.
Dec 07: VK2ZSC, VK2AUP, VK1RX, VK2TBW, VK2BHO.

Thanks to Yutaka Katoh JH1WHS for this comprehensive report.

DX á la carte

• V63JH worked 558 stations from November 5 to 17 from all areas of Japan and four other countries. Jack worked N7BLS, KE7CX, WA6BYA, V73AT, KG6DX and heard VK1RX and N7ET/DU7.
• T3ØJH worked six VK4 stations in Townsville, four from Hawaii and KH6JEB/KH7 during his stay on Tarawa for seven days from December 1.
• 3D2PO was audible in VK3 on December 28 at 0500z and the beacon 3D2FJ.
• V73AT had good propagation into VK2 and VK3 on December 30 from 0400z.
• Northern ZL worked W5, 6 and 7 regions of the US on December 29th.
• Recent DXpeditions to the Pacific have complained that VK stations call them day after day and are not allowing new contacts to be made with other areas.
• The ARRL DXAC has ruled that only ZA1A Albania counts for DXCC so those contacts with JI1DLZ and JF1IST from ZA1 are illegal. It is interesting to note that the contacts made by this pair from 3X1SG are also invalid!
• G4CCZ and G4CVI will reactivate 8R1, Georgetown Guyana, from April 20, 1992.
• Grid is GJ06 and will also include G3SED & G3JVL with QSLs via G4SMC.
• G4CVI and G3JVL will also activate PP8 Brazil for 10 days during May 1992.
• ZX9A and PX5A are callsigns for special events in Brazil and used by PY5CC.
• F8OP has advised that 9U5HU is active from Didier Burundi using a Yaesu FT-690R.
• 5V7JG is still active from Togo (JJ06) using a Yaesu FT-736R and 25 watts.
• An EA4 station reported hearing stations from Townsville in a round-table on 50.100 MHz and was unable to break in.
• A station using the callsign VKØWW has been pirating on 50 MHz and working unsuspecting stations.
• OK stations finally received 50 MHz privileges from December 15th.
• EA stations should have received 50 MHz on January 1. In anticipation, PAØOOS headed to EA8 for a DX operation, while DJ3OS was active from EA6 and EA8.

Thanks to VK3AKK, VK2AGH, VK8ZLX, VK6PA, ZL1MQ/3NE, NI6E, WA6BYA, JH1WHS, JA8RC, JA1VOK Newsletter, NI6E 50MHz DX Bulletin.

See you next time de Steve, VK3OT.

Compiled by Jim Smith, VK9NS
PO Box 90, Norfolk Island, South Pacific 2899

I will take this opportunity to wish the readers of this column a very happy and prosperous New Year. 1991 really was quite a year and as events continue to unfold in the world, the real changes being made are enormous. Even as we speak about Croatia and Slovenia, the events leading to the demise of the USSR, we also have problems on *our* doorstep. Norfolk Island has been in the news as the 'powers that be' would have the island as part of an economy with severe problems. Not that we don't have our share of problems but our financial books are balanced.

The number of countries not permitting amateur radio was reduced in 1991 with amateur radio activity from many rare spots. We of course judge the success or otherwise of such activity in terms of DXCC — has the operation been accepted at ARRL, if so it has been a good one!!

Albania is a case in point. There is no doubt that the various Hungarian groups were operating from Tirana. There is no doubt that they had paperwork which a few months ago would have been accepted without the slightest quibble. Yet today the operations as ZA1QA etc are still not acceptable at DXCC.

However, be that as it may, the point which upsets me and others is that the question of DXCC validity has not been resolved. This matter should have been of the highest priority, leaving no stone unturned to resolve the matter. After all, Albania is just as important to the amateurs who worked ZA1QA (for example) to those who worked ZA1A. A definitive statement "...we have looked into this documentation and it is of no value whatsoever...", followed by the reasons which substantiate such a statement would be great. And, the sooner the better.

Incidentally, I have received several letters from amateurs who read my comments about one of the operators of ZA1A. The one who forgot about the Pacific area, although he was specifically charged with that 'chore'. In one letter received, as I understand things, **Amateur Radio Action** has a new overseas subscriber; he was *delighted* that the situation had been mentioned. Ah well, maybe I expect too much. Should a top-notch DX operator be aware of certain basic propagation facts? One person's sunrise is the other's sunset...

Anyway, enough of all that, so many of you have reported getting your ZA1A cards and of course most know about the crisis in our normally-peaceful household. I had received two lots of ZA1A cards (in response to my two envelopes — I had used those two different addresses being given) and Kirsti had not received her cards. If I told Kirsti VK2-this and VK3-that had received their cards, maybe that was a mistake. You know what it is like... "all you male DXers in your paddy fields"... it was an awkward situation for a while. However Kirsti did eventually get her cards so all is well.

So it is into 1992 with a smile. Can we expect a real start to amateur radio in Bangladesh — I think so. How about Ghana, Iran, Libya, Myanmar and perhaps even North Korea? It would be a brave person indeed who would take a bet on it not happening. However the real Myanmar is off the hook for the moment as XYØRR counts at DXCC.

Iran EP

The surprise of the last couple of days has been the activity from Iran, EP in the form of **EP/HA5BUS**. This station has been very active especially on CW and says he is operating from Teheran. The pile ups have been very heavy but he identifies and gives the QSL information on a regular basis. The operators are all of a very high standard. If this counts at DXCC it will certainly be a turn up for the books as there has not been a valid EP operation for many years.

QSL route:
Globex Foundation,
PO Box 49,
1311 Budapest,
Hungary

Note that **Mohammed**, **EP2MHB** is reported active mostly on 20 metres SSB but his QSL card does not count at DXCC.

QSL route:
Mohammed, **EP2MHB**,
PO Box 154,
Teheran,
Iran

Penguin Island ZSØ

The operation by **Chris**, **ZS6BCR** and other operators commenced on December 16 more or less as planned. They were reported to be very active on all bands, using CW, RTTY, SSB etc. The best shot, from here, was on the long path on 20 metres SSB at around 0500z, split on 14,145/14,175 kHz.

QSL route:
Chris Burger, **ZS6BCR**,
PO Box 4485,
Pretoria,
Republic of South Africa

Afghanistan YA

Romeo was active again as **YAØRR**, for a few days, and at least it gave a chance to those who had missed him last time. I often heard him on 20 metres CW and later on 14,195 kHz on SSB. QSL arrangements are as before.

QSL route:
Romeo, **3W3RR**
PO Box 812,
Sofia 1000,
Bulgaria

OK1IAI/YA is also active but seems to be working CW only at the moment. Kirsti worked him recently on 15 metres CW.

There are conflicting reports on whether **Jacky**, **F2CW** is back in Kabul or not.

Also note that in February/March 1992 a major operation is planned by a group of Russian operators. More details when they come to hand.

Special Call Ecuador HC

From Ecuador, the land which gave us the cubical quad, the 60th anniversary of the short wave broadcasting station **HCJB** was marked by amateur radio activity signing **HC6ØJB**. The station was operated for about 30 hours. The signals were very good and they

were apparently using some of the HCJB commercial antennas. Certainly sounded like it...

QSL Route:
HCJB,
Casilla 17-01-00691,
Quito,
Ecuador,
South America

Myanmar XYØ

I have received word from ARRL that the documentation for the recent **YAØRR** operation has been accepted by DXCC Desk. A number of questions were raised about this operation and of course comparisons made to IZ9A etc. However, the criterion has been that the operation took place from Myanmar territory (rather than territory held by a 'rebel' group, eg Karen). So it now seems that on receipt of the XYØRR QSL card many DXers will have everything worked and confirmed.

In an early-December discussion with **JA1BK** in Japan, I was advised that the cards were already being printed, with Romeo trying to clear everything by the end of December, as Russian postal rates trebled early this month.

Sao Tome S2

There has been activity from this rare one by a group of TR8, Gabon operators signing **S92AA** from Sao Tome. I only heard them on 20 metres CW but they were reported on various nets.

QSL route: F6AXX

Incidentally, I have not heard **Luis**, **S92LB** for some time. He used to be quite active, especially on 15 metres SSB but he was occasionally on the 14,222 kHz. DX net.

Pirate VK callsigns

There has been quite a bit of pirate activity lately by someone using VK call area callsigns. For example, there was activity as VK9WW, Willis Island — QSL to VK9NS. There has also been VKØAI, Heard Island — QSL via VK4DC and VKØWW, Macquarie Island, QSL via buro!! All these operations are on CW and *all* are invalid.

Outside of the use of VK area callsigns we also have a very insistent, or consistent, pirate using Asian callsigns including XYØRR, YAØRR, P5DX and variations.

Mauritania 5T5

Jacques, **5T5CJ** is reported active again, after being off the air for a couple of years. Jacques used to be very active on several bands and was often on the 14,222 kHz DX net. Jacques reports that **5T5DA** is in Mauritania but is no longer active. **5T5HH** is no longer in the country. No new licenses are being issued at the moment.

QSL route:
Jacques Crete, **5T5CJ**,
PO Box 4974,
Nouakchott,
Mauritania

Lebanon OD5

Amer, **OD5QX** is very active on 20 metres at our long path time of around 0500z. His signal is very good here on Norfolk Island.

QSL route:
PO Box 597,
Tripoli,
Lebanon

Western Samoa 5W1

Once again, this island group has been hit by a major storm (Cyclone Val) causing tremendous damage to property and communications. There have been deaths and a great deal of suffering. It is nice to hear that amateur radio has risen to the occasion and has been assisting in communications to and from the island. **Dusty**, **ZL2VS**, well known to the 14,222 kHz DX net, helped with traffic on 14,238 kHz.

Clipperton FOØX

There is still talk about a possible operation from Clipperton during May 1992. As things firm up I will keep you posted.

Navassa Island KP1

The projected operation from Navassa Island, scheduled for January 17 to 23 is still on as I write. The last major operation from Navassa was in 1978 and it is hoped that this latest operation will be at least as good as the last one.

Operators are **Randy**, **NØTG**; **Bob**, **KW2P**; **Will**, **AA4NC**; and **Ron**, **AA4VK**. All will sign own call **/KP1**.

QSL route: NTØG
at his callbook address.

Walvis Bay ZS9

Ian, **ZS9A** is reported active, more or less daily, on 20 metres SSB but the times given are not the best, namely around 1500z. It is hoped that he will try the early morning routine at around 0500z for the Pacific area.

QSL route: ZS1IS

South Sandwich VP8

This operation is still on schedule, with all equipment in place ready for final shipping with the DXpedition team in March. The group is still seeking financial assistance and if you can help, please send your donation to the address below. It is many years since South Sandwich was activated; it is not the best of areas for the Pacific area to work and it will certainly attract a lot of attention. Operators so far are **WA4JQS**, **JA3MAS**, **WA3YVN**, **K5VY**, **W6KMB**, **W7KNT**, **KØIR**.

Donations, please, to:
Jerry Branson, **AA6BB/7**
93787 Dorsey Lane,
Junction City,
Oregon 97448
USA

Christmas Island VK9X

The operation from Christmas Island by **Bob Winn**, **W5KNE**, is still on target and he and **W5BOS** expect to be active from February 11-24, 1992.

Antarctica VKØ

Graeme McDiarmid, **VKØNE** is now on Davis Station, Antarctica, for the coming 1992 season. To drop cargo and staff off at Mawson, the vessel 'parked', at the ice edge, some 37 km from Mawson. On arrival at Davis Base things were slightly different — the ice edge was 13 km from the base and, with a bit of muscle, the vessel got within 3 km of the base. At 3 km this allowed a re-fuelling hose to be used for fuel transfer — a mere 500,000 litres.

Graeme hopes to be reasonably active during his stay.
QSL route: VK9NS
SAE and return postage please.

Bangladesh S2

As I write this I am hopeful that amateur radio will finally get a start in Bangladesh very soon. I have to be honest and say that I am appalled at some of the comments being made in certain DX outlets. Suddenly many are experts in Bangladesh and amateur radio!

Kirsti and I did not go to Dhaka on 'spec' — that is the road of madness. Some 90kg of equipment was carried. If you don't believe this, try to put the simplest of stations together in your mind. Even with all the usual tricks of hand-carrying rigs as hand baggage and such, it is amazing how the weight adds up. Especially when there is nothing available at the other end.

It was not ever the intention to upstage any of the possible local activity — quite the reverse. My whole activity has been geared towards getting the amateur radio service as an acceptable activity in Bangladesh.

On recent events, it was my understanding that, since they had no equipment, we would assist. I have not ever been happy with getting operating permission for foreigners while the local amateurs are denied permission. This does not make sense. However, the announcement at the IARU meeting, in Indonesia, by Saif, President of the BARL, that Bangladesh was issuing licenses was *not* correct.

Using existing BTTB ruling for commercial licensing and station identification (callsign) Saif convinced the BTTB to issue Nazim and himself with a callsign. Each paid about TK1,000 (A$30.00) for their callsigns **S21A** and **S21B**.

To explain more fully, the BTTB licenses commercial stations in two financial steps:

1. A one-time payment for the callsign allocated to the station.

2. An annual payment for the license to use the callsign. This license is linked to the equipment being used and lists model, serial numbers etc. A new license is issued if the equipment is changed but the allocated callsign is retained.

One must also remember that BTTB is completely new to amateur radio and they have been, to my mind, manipulated (or maybe misguided would be a better word). What radio amateur out there has ever considered the statement "I am VK9NS" to mean that I have paid for the callsign but I have no license! Permission to use VK9NS may be taken away due to certain conditions — war, political problems or whatever. But our callsign and the license to use it are linked irrevocably.

So in the four or five days covering our travel, Saif had returned from Indonesia, via Singapore and had been to BTTB.

In discussion, I later pointed out to Saif that, for the national societies such as the WIA, RSGB and ARRL (and I am a member of each) to be part of the amateur radio licensing policies, at government level, (eg WIA/DoTC), it has taken years and *years* of work. We may not always agree with our national societies but they are the amateur's link with the government administration.

I also pointed out to Saif that he should be proud that BTTB is even dealing with BARL as in these early days it has little substance in reality. Of course this should change in the years to come.

Despite the basic agreement of getting a club station started, both Saif and Nizam have both accepted radio equipment from INDEXA. Kirsti and I carried equipment to get things started for the benefit of all those interested in amateur radio in Bangladesh. In my view it is a fundamental error to donate to an individual as this is the road of petty jealousies. Every dollar of equipment donated to Bhutan was given to the Ministry of Communications, not to any single individual. In Australia we try to avoid disposing of equipment to unlicensed people.

Everything will be finally resolved soon and my 28 days in Dhaka was not wasted. My hope is that amateur radio will rise above personal preferences and that the 14 other nationals and the 10 foreign nationals will strive to make the BARL a valid organisation.

It may be that Bangladesh will become just as available as the various BY, BZ stations in China. It took the Peoples' Republic of China several years to get from the club station to the individual license but it happened. This is our faith in the hobby of amateur radio.

I have been promised a telex as soon as things are finalised. I repeat my original assertion that the members of the BTTB board have done a tremendous job and I for one wish amateur radio in Bangladesh every success. The group in Bangladesh certainly needs plenty of assistance and interest from outside the country.

ARRL 10 metre contest

With just over 2,000 QSOs on CW and SSB during the ARRL 10 metre contest weekend I felt happy that the band held up as long as it did. Certainly the band just *died* on several occasions with some longish spells of CQ and no takers. A rough count shows that my totals will be a bit under 1,000,000 points but it was fun anyway. All states were worked (good since they are multipliers) but only one each of Wyoming, North Dakota and South Dakota QSOs, so those areas of the USA remain hard to get.

DXCC news

There have been two changes to job titles in the DXCC area:

1. **Tom Hogerty**, **KC1J** formerly Special Projects Manager, is now DXCC Branch Manager.

2. **Don Search** is now DXCC specialist.

Tom made his mark in supervising the automation (computer data base) of all DXCC transactions.

Tom Mulder VK6MK

I would like to wish **Tom**, **VK6MK** a speedy and full recovery from his present illness. Tom is one of the old timers of DXing, a gentleman in every sense of the word. Tom worked Albania for his last DXCC country just a few weeks ago.

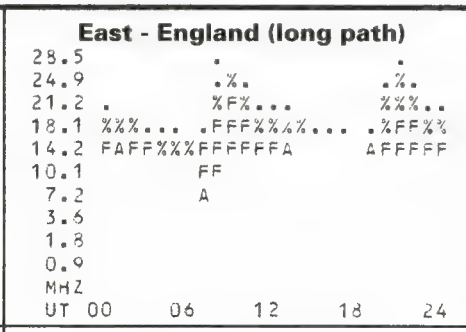
So another year, another 13 issues of the **Amateur Radio Action** column has been completed. In terms of DXing it was an eventful year and the DXer will wait to see what 1992 has to offer. To the many DXers who keep me informed by telephone, Fax and on the bands many thanks.

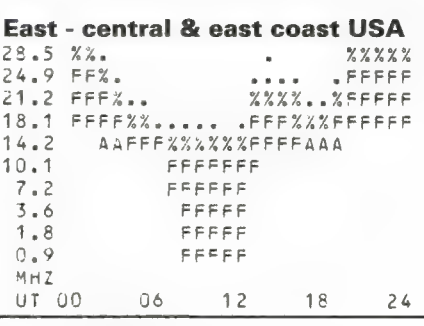
A special thanks is due to the various DX outlets:

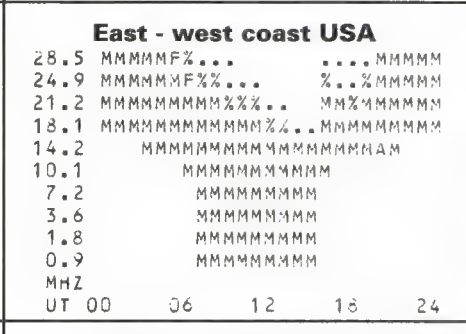
Inside DX, QRZ DX, Les Bacores DX, Long Island DX Bulletin, JA 59 Magazine, JA DX News, RSGB DX Newsletter, DXpress, W6GO/K6HHD Managers List, Lynx DX Bulletin, MDXN, and more.

73 from Jim, VK9NS.

Propagation







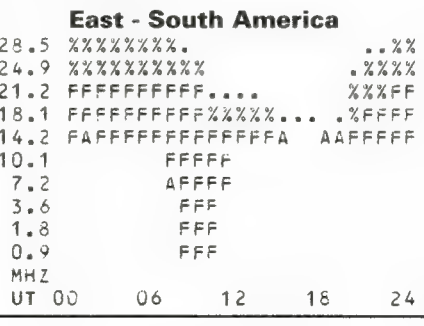
ABOUT THESE CHARTS

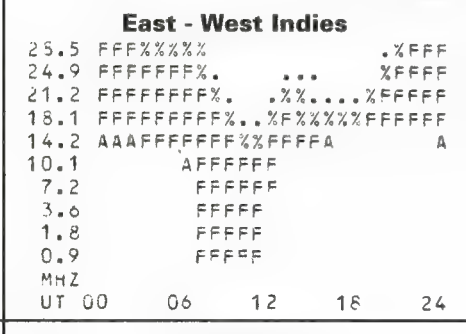
The data on these pages are graphs showing forecasts for expected HF operating conditions between Australia and a number of important DX destinations. The information they contain is prepared by **IPS Radio and Space Services**, a division of the federal Department of Administrative Services. IPS monitors changing radio conditions — which are affected most greatly by fairly predictable changes in solar activity — and issues reports and warnings based on that data.

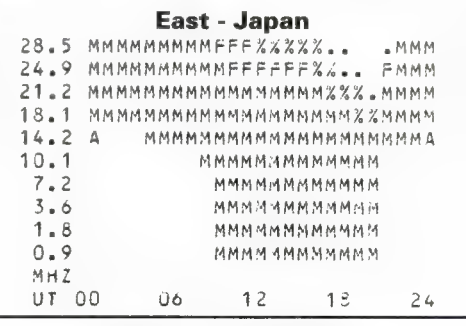
Stations in the eastern half of Australia should refer to the graphs on page **60. The data on page 61 is calculated for stations in the western half of the continent.** Of course, if you're stuck right in the middle, try reading them *both* — then make an educated guess...

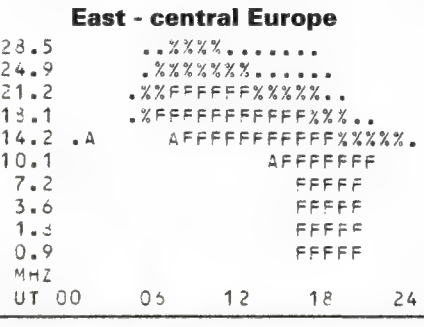
The horizontal axis of each graph represents the hour of the day expressed in Universal Co-ordinated Time, or **UTC**. The vertical axis lists specific points within each HF amateur band.

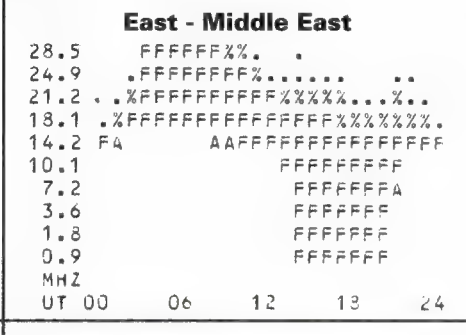
The maps are *easy* to read. First, go to the map which looks closest to the area you're interested in, look *up* from the time and *across* from the selected band to the point at which the two variables merge. Note which symbol — if any — appears at the intersection of the particular time and frequency combination for that area and refer to the legend at the right to find the sort of propagation most likely to apply. If the space is blank the forecast is *not* good — your time and frequency combination is unlikely to allow communication to the destination station.

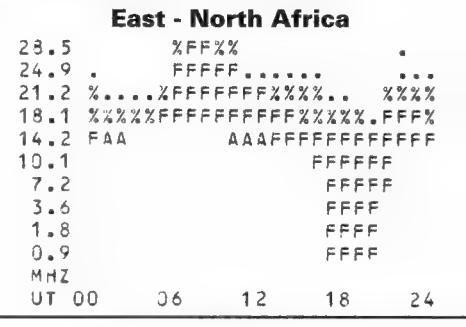


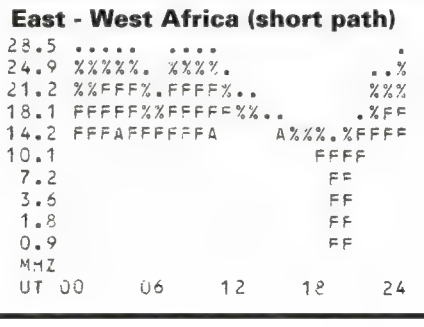


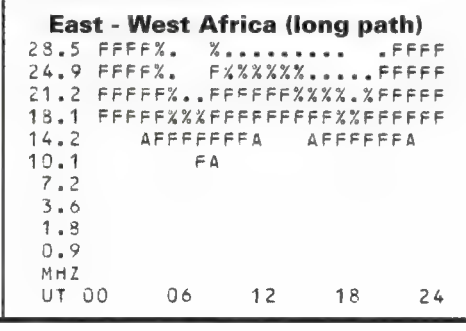


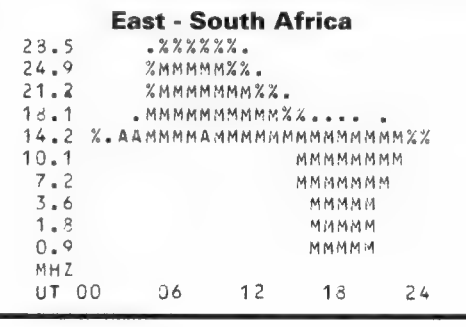










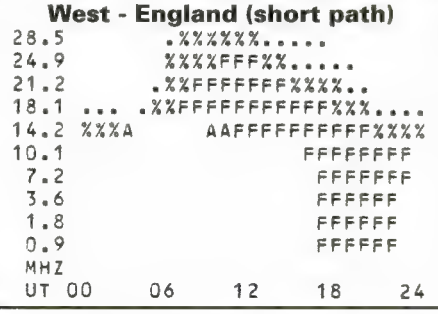


forecaster Feb 1992

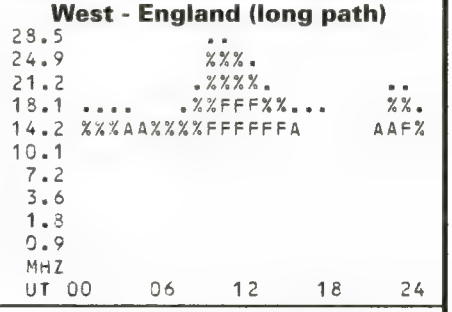
LEGEND TO SYMBOLS

- ■ Propagation is *possible*, but unlikely at this time and frequency on more than half the days of the month.
- % This frequency / time pair should allow communications on between 50% and 90% of the month.
- F Your best bet — first 'F' mode conditions should apply on at least 90% of days this month for the given time and frequency.
- E Propagation via the 'E Layer' expected on up to 90% of days of the month at this time and frequency.
- P A fair mixture: up to 90% chance of a path using 'F Mode' *and* between 50% and 90% probability of an 'E Layer' path.
- B A good mixture: up to 90% chance of a path using *either* 'E Layer' or mixed 'F' modes.
- M A mixture of combined 'F' modes — both first and second mode up to 90% of the time.
- S Second 'F' mode conditions should apply on at least 90% of days this month for the given time and frequency.
- A High atmospheric absorption of the signal is likely — better to use a higher band. Too close to ALF for good HF signals.
- X A complex mixture of modes is likely to apply, and could possibly include the second 'E' mode.

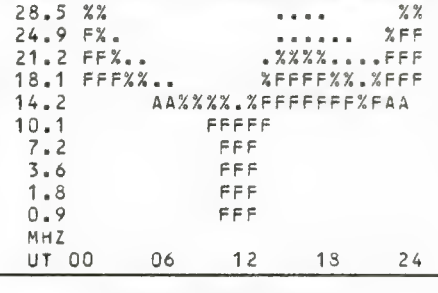
West - England (short path)



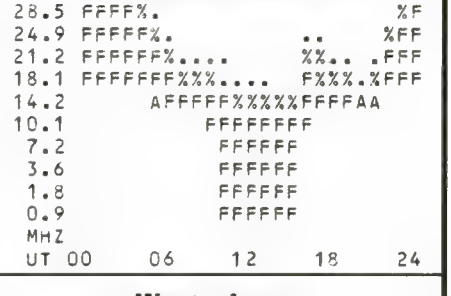
West - England (long path)



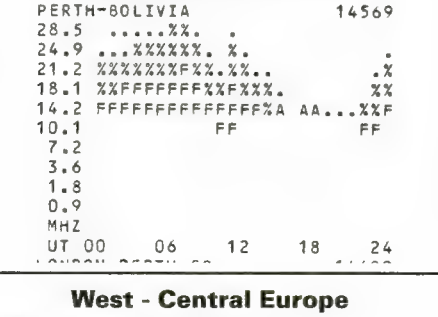
West - central and east coast USA



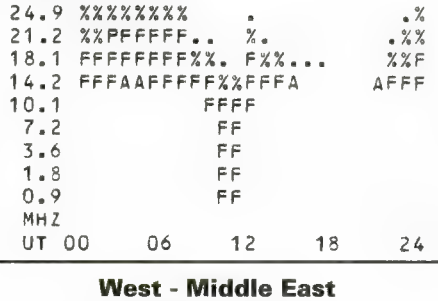
West - west coast USA



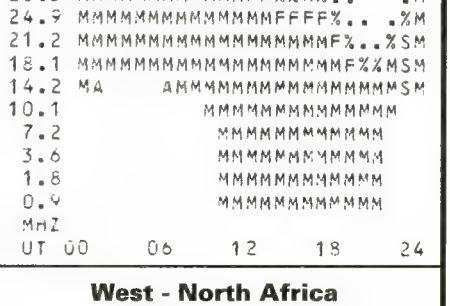
West - South America



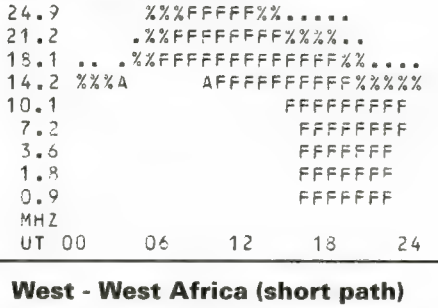
West - West Indes



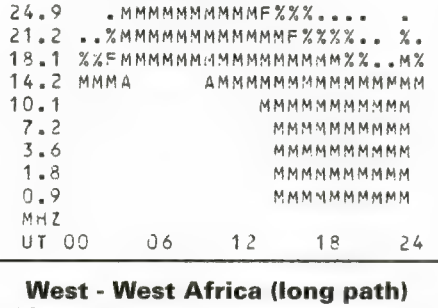
West - Japan



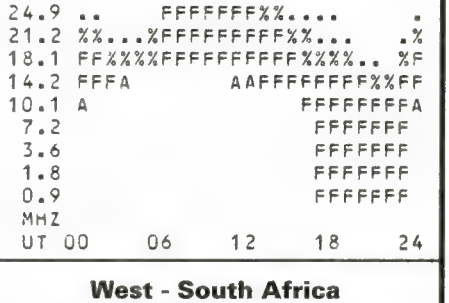
West - Central Europe



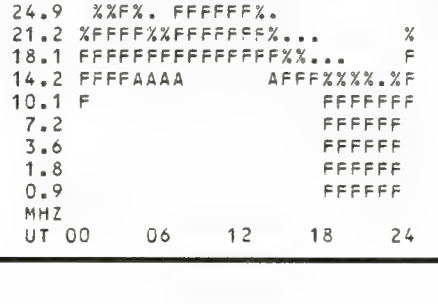
West - Middle East



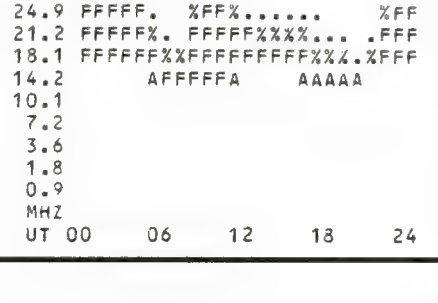
West - North Africa



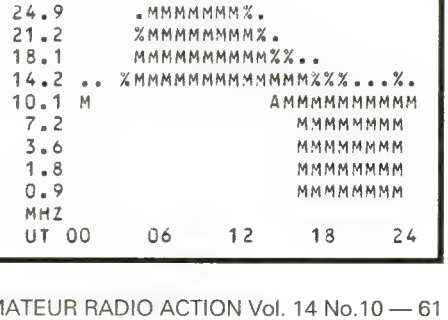
West - West Africa (short path)



West - West Africa (long path)



West - South Africa



... CLASSIFIEDS ... CLASSIFIEDS ... CLASSIFIEDS...

VK1 AREA

Wanted: Microreader to receive Morse/RTTY signals, connects straight to spkr sckt. As seen in *Practical Wireless*, Oct.1990. Also: Modem to send & receive CW/RTTY with Commodore 64 or Amiga 500, will pay postal costs anywhere in Aust. Fred, VK1NAL (06) 285 2059

VK2 AREA

AEA PK-64 Pakratt plug-in modem for C-64. All s'wre on board. HF board installed for Packet, Amtor, ASCII, Baudot, Morse $250. John, VK2GFA (045) 72 5844

Alinco DJ-100T 2M HT, new cond, extra batt case. $280. **IBM** compat port PC/XT turbo, 640kB RAM, 20MB hard disk, 5.25" & 3.5" drives, Hercules monitor, int modem, serial/parallel ports, EC $975. **Yaesu** FT-4700RH dual-band 2M/70cm 45W, new, unused boxed. Incl. panel separation kit $890. Consider exchange HF txvr. Brad, VK2KQH (02) 906 5855 or (018) 64 0377. Transmitting gear sold to licensed amateurs only.

Amateur **Callbooks** 1991, international & North American listings, both vols. $73 posted. Steve, VK2PS (02) 654 1809

ATV 23cm FM tx 500mW incl. video pre-emphasis & sound mod. Exc picture & sound qual, needs 12V @ 300mA. Designed in Germany, with all diags $340. VK2GKA (048) 61 2702. Licensed amateurs only.

Complete HF/VHF station: **Kenwood** TS-440S and TS-130S HF txvrs, **Kenwood** TR-741A 2M FM txvr, **Icom** IC-02A 2M FM HT, pwr supps, antennas, rotators, testing equip. many items in VGC. $8500 replacement value, genuine offers cons. Jim, VK2KAX (043) 41 7693. Transmitting gear sold to licensed amateurs only.

Cushcraft 2M beam, twist or twin boom. 11-el, was X-beam, collect from QTH. $90. Colin, VK2APS (075) 54 4999

Kenwood PS-51 pwr supp $395. **Kenwood** TS-140S HF txvr $1295. Both new, warr. **Shure** 404C mics $95ea **RAK** balun $45. **ATU** (EA) HF $195. **Siltronix** miniature SWR meter $45. James, VK2DXM (02) 622 6268. Transmitting gear sold to licensed amateurs only.

Kenwood R-2000 HF rxvr with dig disp. Superb rxvr, easy to use $650. **AOR**-2001 scanner, with manual, covers 25-500 MHz. $425. Henry (02) 925 0102

Kenwood TS-93X-AT HF txvr Ser No 4110404. PC $1950 ono. Lawrie, VK2FIF (066) 28 0418

Kenwood TS-520S HF txvr, with matching desk mic, dig disp, ATU, spkr, 2m/6m xvtrs, $1000. **Yaesu** FT-290R 2M all-mode txvr with mob brckt $500. David, VK2DSU (049) 46 7118. Licensed amateurs only.

Printer: CP-80 80CPS 9-pin normal/double width & compressed print. Single or fanfold paper 4"-10". Parallel i'face $150. Don, VK2BDU (058) 81 1267

Solar panel approx. 70W (18V @ 4A) with aluminium frame. $500 GC. Josh, VK2KJD (02) 488 8697

Wanted: inst book (copy?) for Daiwa ATU, mod CNA-1001. Will pay all costs. Bruce, VK2BDX (049) 56 6387

Wanted: Kenwood AT-130 ATU. Frank, VK2CWL (068) 89 0535

Wanted: Tower, winch-up tilt-over, 40-60' in GC. Also **Yaesu** YP-150W meter, 300Hz CW filter for FT-101ZD. Ian, VK2WR (02) 634 7210

Wanted: Yaesu FT-301 txvr. May trade FT-107DM in VGC. Lyn, VK2ANI (069) 25 5080

Wanted: Yaesu FTV-707 2M transverter module for FTV-707 or FTV-107R. Dan, VK2GG (049) 73 3616

Yaesu FL-7000 all-band 1200W linear amp $2000 plus freight. **Hy-Gain** HT-18 all-band vert antenna, no traps, 1st rate cond. Purchaser to remove $250. **Kenwood** TS-900 with ext VFO & spare tubes. RX perf, TX needs attention. $145 plus freight. Tom, VK2SV (065) 82 1114. Licensed amateurs only.

Yaesu FT-726 triband VHF/UHF base txvr with HF, 6, 2 and satellite options $1500 ono. **Yaesu** FT-101Z digital disp kit $120 ono. Paul, VK2ZNK (02) 638 2877. Transmitting gear sold to licensed amateurs only.

VK3 AREA

DRSI PC*PA card, type 2, two DCD machines (runs open mute) sale to fund 2400 band system $350. Try it on 144.900 or 147.600 using VK3JMA-1. Mark, VK3JMA (03) 702 8557

Emotator 502SAX h/d rotator with all controls & manuals $375. **Daiwa** mic compressor mod MC-330 $75. **Sony** b/w TV camera with adaptor $100. **Kenwood** MC-50 mic $85. Ray, VK3CDR (03) 726 9222

Emtron EAT-300A tuning unit. $240 or swap for good 3-motor quarter track, reel-to-reel tape deck. John Wickham, VK3KGP, 3/144 Danks Street, Albert Park 3206

Kantronics KAM all-mode TNC complete with Hostmaster II software, brand new in carton $525. VK3JD (03) 645 2695

Kenwood TH-25A 2M HT ser no 9041147 $150. **Yaesu** FT-207R 2M HT with NC-3CHG spkr/mic $150. **Dentron** MLA-1200B HF-PA needs assembly $250. **Tait** Unicom airbase MTAF CTAF freqs $500. VK3OT (055) 72 3333. Licensed amateurs only.

Kenwood TS-120S 100W HF txvr with VFO-120 ext VFO & workshop manual $550. Can arrange inspection/delivery in Melbourne city area. Chas, VK3BRZ (052) 82 3167. Licensed amateurs only.

Kenwood TS-680S HF+6M txvr in orig box with full service manual & MB-48B DTMF mic $1200. David, VK3XAX (03) 878 8936. Licensed amateurs only.

MFJ-941D deluxe HF ATU. Has 4-1 balun, antenna c/o switch, as new $180. **Tokyo** Hypower HL-37V 2M linear

30W out with rx preamp, as new $150. **Tandy** TRS-80 model 2000 computer, 256kB RAM, 10MB hard drive, 5.25" floppy, mono monitor, GC $150. **Yaesu** YD-148 desk mic GC $50. Damian, VK3EHP @VK3IBM (053) 52 4183. Transmitting gear sold to licensed amateurs only.

MFJ-1278 multi-mode TNC with grey-scale modem & 2400 bps board, incl Multicom software $550. Damien, VK3CDI (054) 27 3042

Realistic PRO-2004 scanner, covers 25-1300MHz, 400 ch in AM, narrow & wide FM modes, adjustable ant & manual. New cond. $350. Doug, VK3EIM (03) 571 7219

Tower: 60' triangular, self-supporting; fair cond $250. Fred, VK3DNP (053) 52 1829 A/H, (053) 52 1849 B/H

Towers 60' crank-up tilt-over free-standing, $450 plus freight. 25' triangular free-standing, $50 plus freight. Mal, VK3MJG (053) 82 2309

Uniden HR-2510 10M all-mode txvr, no mods, PC $290. Neil, VK3BCU (03) 336 1491. Licensed amateurs only.

URGENT!! Free-standing tilt-over 40' two-section triangular tapering tower for *immediate* removal. New occupants move in ob Feb 4! Inspection welcomed... but please hurry! Only $300. Graham VK3ZS (03) 596 8272

Various: Disk Drives: 1.2MB in case, tested OK, EC $80; two 720kB in metal cases, tested OK, EC $40ea; Full-height 35 track single-sided, suit TRS-80 system, VGC $20. **Kenwood** SMC-30 spkr/mic, plug replaced, VGC $10. **Joysticks** to suit Tandy CoCo 1, 2, 3 4 @ $4ea.

Patrolman 50 VHF/UHF rxvr, tunes 520-1620 kHz, 30-50, 88-174, 450-512 MHz, VGC $30. **Sony** AVC-3420-CE B/W video camera. Suits AV-3400 vtr, viewfinder not working, otherwise VGC. Has switches to reverse scan coils, 2X televerter & 12.5-70 zoom lens, new hood & cover $100 ono. **Tandem** 6520 terminal, RS-232, switchable baud rate, with manual. White screen GC $10. **Vinten** MTR-13 VHF txvr converted to 2M. Needs tuning, VGC, has some xtals. $20. **Yaesu** FT-207 2M HT. Has repeater reverse mod, won't fit power base due to mod on base. No charger or batt, but comes with 11.6V regulator for car or 13.8VDC supp. MRF-230 final, rubber duckie antenna. DC socket on base. VGC $100. Wenlock, VK3YWB (03) 466 4245. Transmitting gear sold to licensed amateurs only.

Wanted: 6M transverter to suit Kenwood TS-520S HF txvr. Info wanted, copy of circuits or manuals for Tiara 11 10M linear, LA-280 University VTVM MVA6. Dennis, VK3TDG (054) 76 2243

Wanted: AWA RT85 for 2M. Will trade UHF RT85 or cash. David, VK3HZ (03) 665 8877 B/H

Wanted: Collins KWM2A txvr or late-mod 'S' line equip in EC. Will pay top price. Rob, VK3JE (060) 37 1262 or (03) 584 5737

Wanted: DG-5 dig freq display to suit TS-520S. **Also** manual for Dick Smith Q-1280 CRO. Will pay for copying & post. Dave, VK3ETL (050) 25 3531

Wanted: Kenwood TS-930 or TS-940 HF txvr. Jack, VK3SP (03) 842 1841

Wanted: KW 107 super match/tuner. VK3JD (03) 645 2695

Wanted: Original 40CH CPI CB working or not. 40CH ROM must be OK. For conversion to 10M. Gordon, VK3GRJ (054) 86 2328

Wanted: Transformer 1000V 300-400mA. Also wanted: electrolytic capacitors 300-400V 200µf. Damian, VK3EHP (053) 52 4183

Wanted: Yaesu FR-DX400 rxvr to complete my collection. Gordon VK3NGB (055) 99 2545

Wanted: Yaesu FRG-7700 HF comms rxvr. Must be in EC. Call from anywhere. Mark (050) 23 2105 B/H

Yaesu 3-el tribander complete with 2kW balun & insts $250. **Bencher** iambic paddle, black with original box plus electronic keyer & insts. $100. Brendan, VK3FXB (03) 435 2847

Yaesu FT-101E HF txvr & FV-101 mic. All manuals & spare valves GC $600. David (03) 876 3623. Licensed amateurs only.

Yaesu FT-290R 2M all-mode port txvr with up/down hand mic. $350. Rob, VK3VOS (03) 364 0078. Licensed amateurs only.

Yaesu FT-726R all-mode VHF/UHF txvr. 240V or 12V, no p/s needed, comes with 2M 70cm & satellite modules, mic, operating manual, workshop manual (can do 15m, 10m & 6m with extra modules). EC $1500 neg.

Yaesu FT-480R all-mode 2M txvr with mic, operating manual, workshop manual, GC $450 neg. **Tower** 45' free-standing triangular with all computations, dismantled, ready to erect $350 neg. Geoff, VK3JDG (03) 367 1980. Transmitting gear sold to licensed amateurs only.

Yaesu YH-55 earphones, as new cond, outstanding performers for CW DX! Roth, VK3BG (03) 725 3550

VK4 AREA

Home-brew HF linear, RSGB design with two 813s. Incl pwr supp $250. Kevin, VK4WA (07) 814 2480. Licensed amateurs only.

Icom IC-761 HF txvr with in-built auto ATU. This top unit is 2yrs old but has *never* been used. Half price at $2900. (018) 42 4760. Licensed amateurs only.

Icom IC-3200A dual-band mobile FM txvr with duplexer, good running order $550. **Yaesu** FRG-7 rxvr. Mike, VK4MQ (071) 24 1965. Transmitting gear sold to licensed amateurs only.

Kenwood CD-10 callsign display unit. $60 Glen, VK4UGC (075) 35 0919

Kenwood TS-680S HF+6M txvr, with matching AT-250 auto ATU, Emtron EPS-30 pwr supp, balun. All only 6mths old. Under warr. Save.

CAVEAT EMPTOR — BUYER BEWARE

The acceptance of classified advertisements in the Amateur Radio Action classified advertising section does not warrant in any way that the goods offered are available, free of any encumbrance, in working order or otherwise satisfactory. The purchase of goods by private sale does not offer the purchaser any protection under law, and buyers should be certain the goods under consideration are suitable for the purpose for which they are required. Amateur Radio Action cannot accept any responsibility for goods advertised in the classified pages and no correspondence will be entered into regarding such goods.

The onus is on you...

... CLASSIFIEDS ... CLASSIFIEDS ... CLASSIFIEDS...

$1200. Tony (079) 59 8777. Licensed amateurs only.

Ramsey Com3 comms service monitor with padded carry case, mostly bench use. Clean cond $3800. Peter, VK4AWP (07) 266 0280 B/H, (07) 264 1575 A/H

Wanted: Icom IC-120 23cm 1W txvr or sim. Fair price offered. Kevin, VK4WA (07) 814 2480

Wanted: Icom SP-20 ext spkr. Glen, VK4UGC (075) 35 0919

Yaesu FT-101B HF txvr with unused finals, CW filt, FV-101B ext VFO, FTV-650B 6M & FTV-250 2M transverters, manuals, cables, PC $550. **Swan** 250 6M 100W txcr, manual, with 240V P/S $250. **Realistic** DX-160 comms rxvr with manual, PC $150. VK4IT (07) 266 5922. Transmitting gear sold to licensed amateurs only.

Yaesu FT-208R 2M FM HT, 2 batts, spkr/mic, soft case, manual $300. Paul, VK4PW (07) 803 6674 or 018 78 1891. Licensed amateurs only.

Yaesu FT-747 HF txvr, tip top unit with FM module, mobile bracket, mic. Station upgrade planned, need finance $950. Finn, VK4LL (07) 344 2405 all hours. Licensed amateurs only.

WEATHER FAX PROGRAMS

RADFAX2 is a high-resolution shortwave weather fax receiving, displaying and printing program for the IBM XT or AT computer with a CGA, EGA, VGA or Hercules card. (Please state which.) Programs are $35 each plus $3 postage, and are supplied on 5.25" or 3.5" disk (please state which) plus full documentation.

Programs are available only from: M Delahunty, 42 Villiers Street, New Farm, Qld 4005. Phone (07) 358 2785

Satfax, a weather satellite picture receiving & displaying program for EGA & VGA, is avail for $45 plus $3 P&H.

VK5 AREA

Bearcat 100XL scanner, hand-held 16ch with NiCds & chrgr $225. Graham, VK5ASI (08) 258 8310

Icom IC-2GAT 7W 2M HT with pwr adaptor & BP-4 batt case, HM-46L spkr/mic, chrgr, orig pack. Offers around $470+ please. These things cost me a *fortune* new. *(Do you want the good news or the bad news? Ed.)* Also **Icom** IC-μ2AT $250 Upgrading to base rig... **Tower** 10M guyed narrow Hills triangular section with rotatble pole from top to bottom. No rotator, suit light VHF/UHF arrays only $100. 0.25" steel cable guys to suit $125. All 12 mths old. Ben, VK5GX (08) 295 5197. Transmitting gear sold to licensed amateurs only.

Kenwood R-5000 comms rxvr with 6kHz, 1.8kHz & 270Hz opt filts. $1835 to buy new, sell for $1000 ono. Craig (08) 258 5701

Kenwood TR-2400 2M FM HT, mint cond, with base stand ST-1, carry case, power pack, books, carton, guaranteed A.1 $275 ono. incl. freight. Eddie, VK5NEH (08) 255 1084. Licensed amateurs only.

Kenwood TS-520S HF txvr incl Kenwood SP-520 spkr, Kenwood MC-50 desk mic & manual $480. **Yaesu** FC-707 ATU GC $180. Peter, VK5ZCV (085) 23 1638. Transmitting gear sold to licensed amateurs only.

Yaesu FT-747GX HF txvr with FM board, manual, technical supplement. As new in orig carton. Exc mobile unit $900. John, VK5CJP (08) 336 5404. Licensed amateurs only.

VK6 AREA

Kenwood TS-940S HF txvr, with tuner, mic, box, book, nice rig $1990. **Icom** AT-500 1000W auto tuner with warranty $750 plus freight. Graham, VK6RO (09) 451 3561. Transmitting gear sold to licensed amateurs only.

Wanted: FRV-7700 VHF converter for FRG-7700 rxvr plus a cheap oscilloscope. Phone weekends only, please. Brett (09) 454 4716

Wanted: Vibroplex semi-auto 'bug' Morse Key. Phil, VK6CE (09) 572 4336

VK7 AREA

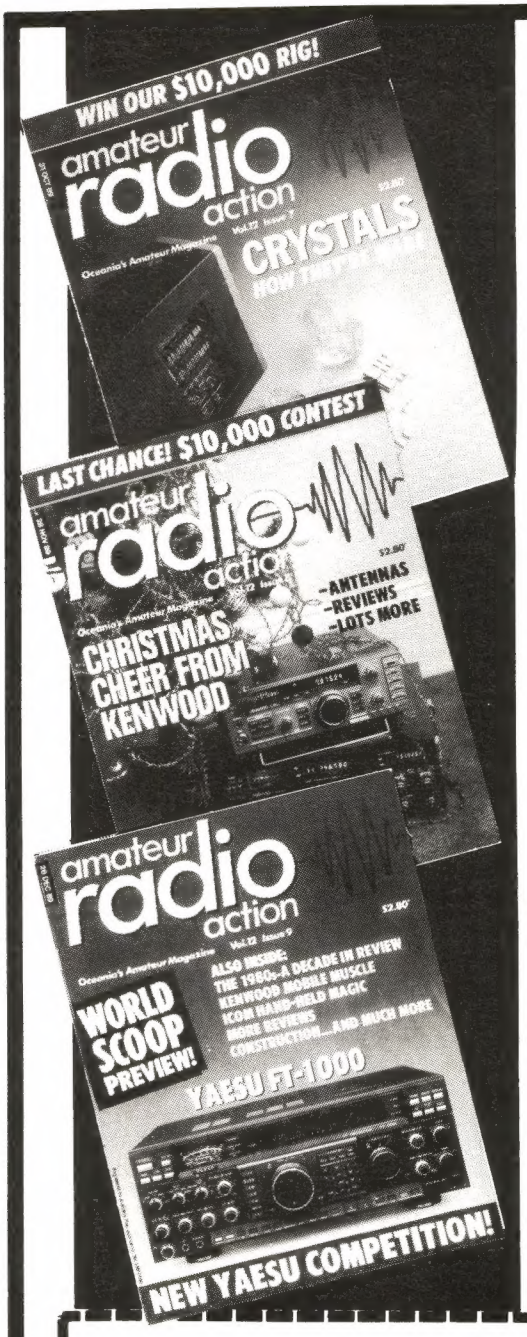
Wanted: Kenwood MC-30S hand mic. Athol, VK7ZW (004) 91 1697

QSL CARDS

QSL cards, white or colored, pre-printed or fully personalised with callsign, operator's name, QTH, station equipment, QSO panel, with or without logo. Top quality cards at best prices — eg. 200 fully-personalised cards for just $38.40.

Send 90¢ stamp to BINT Services, PO Box 323, Cheltenham 3192 for samples and prices.

All telephone numbers in the Amateur Radio Action Classifieds are after hours unless otherwise noted



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Signature.....

ARA 14/10

◀ *This is a corner flash!*

amateur radio action

Readers of **Amateur Radio Action** may use the **FREE CLASSIFIEDS** column to the extent of 25 words absolutely *free!* This offer applies only to *private* 'For Sale' or 'Wanted' classified listings, and to computers, software or computer peripherals with an amateur application. A **limit of one** classified advertisement applies to each advertiser. Any additional words must be paid for or the advertisement **will not be accepted**.

A nominal fee of $3 per additional 25 words or part thereof will apply. This fee should accompany your material. Photographs may also be included, at a cost of $5 per insertion, with a limit of one photograph per advertisement. Clear prints are required, and will be reproduced over a one-column width.

Your advertisement's inclusion cannot be guaranteed, but every effort will be made to place your advertisement in the issue following receipt of copy. The 25 words must include your name, callsign and phone number.

The publisher reserves the right to amend or reject any advertising material considered unsuitable for publication. No correspondence will be entered into.

Repeat **FREE CLASSIFIEDS** advertisements will be accepted for a fee of $3 for *each* 25 words—*including* the first 25. Once again, this fee should accompany your material.

Free advertisements for **commercial goods or services** will not be accepted for publication in these Classifieds pages. Instead, special rates apply for commercial advertising material which appears in the display pages of **Amateur Radio Action**. For details of display advertising phone Kate Shaw on (03) 601 4240.

Readers should note that all advertisements are required to comply with the provisions of the Victorian Consumer Affairs Act of 1972. They should be aware that, under the above Act, Post Office box numbers can be published *only* if the full name and residential address of the box holder is supplied with the advertising material.

This form is to be used for all classified advertising material in **Amateur Radio Action**. Letters on plain paper requesting the insertion of a free classified advertisement will not be accepted without an original corner flash from an issue not more than three months old. Photocopy or clip this form and post it ***with the corner flash*** to:

Amateur Radio Action Classifieds,
GPO Box 628E,
Melbourne 3001

IMPORTANT NOTICE: Unsuitable material includes advertisements for wanted amateur transmitting equipment where no call sign is shown, sale equipment modified for general coverage transmit, non-amateur transmitting equipment (including CBs) or equipment modified for use on CB, marine or other non-amateur bands.

You may fax your copy to (03) 670 9096 *only* if under 25 words.

***Next issue's deadline:* February 5**

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PAY $3 PAY

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advertisers' index

MFJ Tuners

All available from stock! No need to wait for the best value tuners around.

HF Tuners - 1.8 — 30MHz

MFJ989C	3kW 'Top of the line'	$756
MFJ986	3kW Differential 'T'	$582
MFJ962C	1.5kW	$499
MFJ949D	300W Deluxe w dummy load	$325
MFJ948	300W Deluxe, no d/load	$280
MFJ941E	300W General purpose	$238
MFJ945D	200W basic mobile	$195
MFJ16010	200W long wire, no meter	$86.30
MFJ901B	200W basic, no meter	$130
MFJ1040B	350W tuner/preselector	$214
MFJ931	Artificial Ground	$173

VHF & UHF Tuners

MFJ921	2 mtr 300W tuner/SWR mtr	$154
MFJ924	70cm 300W tuner/SWR mtr	$154

MFJ SWR meters

Something for just about every purpose.

MFJ815B	2kW Crossed needle HF	$151
MFJ817	200W X needle VHF/UHF	$176
MFJ816	300W conventional HF	$65
MFJ812B	300W conventional VHF	$65
MFJ841	5W 2mtr hand-held SWR	$87.90

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MFJ207	1.8-30MHz SWR analyser	$219
MFJ208	2mtr SWR analyser	$197.89
MFJ204B	1.8-30MHz Antenna bridge	$173
MFJ206	1.8-30MHz Current probe	$173
MFJ202B	1-100MHz Noise bridge	$162

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MFJ250X	2kW PEP Can type (no oil)	$62
MFJ260B	300W 150MHz Air cooled	$62
MFJ262	1kW 30MHz Air cooled	$139.90
MFJ264	1.5kW 650MHz Air cooled	$129.90
RA38	Resistor for MFJ260B	$29.70
RA39	Resistor for MFJ264	$86.40

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MFJ1702B	2 pos 1kW SO-239 conns	$43.90
MFJ1702BN	2 pos N conns to 1.1GHz	$63.90
MFJ1704	4 pos 1kW SO-239 conns	$119
MFJ1704N	4 pos N conns	$140
MFJ1701	6 pos 2kW PEP HF only	$69.90
MFJ1700B	2 x 6 pos 2kW PEP HF	$129.90
RCS-4	4 pos remote mount HF	$354
RCS-8V	5 pos remote mnt 250MHz	$409.20

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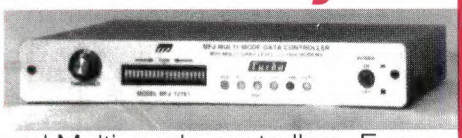

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MFJ1274	HF/VHF w tuning indicator	$299
MFJ1274T	1274 with 2400bps	$399

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MFJ2400	2400bps add-in modem	$170
MFJ2400X	2400bps modem for PK-232	$170
MFJ9600	9600bps add-in modem	$199
MFJ1272B	MIC/TNC switch for MFJ	$76.80
MFJ1272BX	MIC/TNC switch for AEA	$76.80
MFJ1315X	12VDC plug-pack for TNC's	$18.50

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MFJ1281	EasyDX Log+Terminal(PC)	$62.95
MFJ1281M	3.5" disc version	$62.95
MFJ1282B	Multicom for C64/128	$79.95
MFJ1283	Tape package for VIC20	$49.95
MFJ1284	MFJCOM (basic) for PC	$49.95
MFJ1284M	3.5" disc version	$49.95
MFJ1287	Starter pack MACINTOSH	$49.95
MFJ1289	MUTICOM for PC	$78.50
MFJ1289M	3.5" disc version	$78.50

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To connect to MFJ TNC's

MFJ5022	Alinco HT (not DJ100)	$29.95
MFJ5024	ICOM & Yaesu HT	$29.95
MFJ5026	Kenwood HT (not 2500)	$29.95
MFJ5080	Yaesu 8 pin	$29.95
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